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THE PHILIPPINE
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VOL. IX JUNE, 1914 No. 3

SOME PHILIPPINE SCYPHOMEDUSÆ, INCLUDING TWO NEW GENERA, FIVE NEW SPECIES, AND ONE NEW VARIETY

By S. F. LIGHT
(*From the Zoölogical Laboratory, College of Liberal Arts, University of the Philippines*)

Sixteen text figures

The Scyphomedusæ described in this paper are in the museum of the zoölogical department of the University of the Philippines. Many of them were collected on the joint scientific expeditions of the University of the Philippines and the Bureau of Science, while others were collected at various times by members of the zoölogical department. They are not the result of a systematic collection of Philippine Scyphomedusæ which, judging from the percentage of new species in the Philippine collections of the United States Bureau of Fisheries steamer *Albatross*[1] and in the present collection, should produce many new and interesting forms.

The collection includes medusæ of 12 species in 11 genera, and 1 doubtful immature form. All but three are new to the Philippines, and 2 genera, 5 species, and 1 variety are new to science. A list of the genera and species follows. Those starred are reported from the Philippines for the first time. The new genera and species are indicated by black-faced type.

1. *Chiropsalmus quadrigatus* Haeckel.
*2. *Dactylometra quinquecirrha* L. Agassiz, "*Chrysaora* stage."
3. *Aurellia labiata* Chamisso and Eysenhardt.
*4. *Cassiopea polypoides* Keller var. **culionensis var. nov.**
*5. *Cassiopea* **medusa sp. nov.**
*6. *Cephea cephea* (Forskål) Mayer.
7. *Catostylus purpurus* Mayer.
*8. *Mastigias papua* L. Agassiz.
*9. **Acromitus maculosus gen. et sp. nov.**
*10. *Lobonema* **mayeri sp. nov.**
*11. **Lobonemoides gracilis gen. et sp. nov.**
*12. *Rhopilema* **visayana sp. nov.**
13. *Cassiopea polypoides* Keller (?).

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[1] Mayer, A. G., Medusae of the World, *Pub. Carnegie Inst. Wash.* (1910), No. 109, 3.

It will be noted that 8 of the species reported, including all the new forms, belong to the suborder Rhizostomæ. This essentially tropical suborder seems to include the greater part of the Philippine forms as 16 of the 29 species and varieties reported from the Islands belong to that group. There are undoubtedly many medusæ new to science and others as yet unreported from the Philippines to be found in the waters of the Archipelago. While on launch trips, during May and June, 1913, along the coast of Palawan and the islands between Palawan and Culion, I saw many medusæ not found in this collection. Most of them were Rhizostomæ, but at least three species of Pelagidæ were common. Large Beroe-like ctenophores were also very numerous, but attempts to preserve them were unsuccessful.

While I have attempted to give a fairly complete description of new species and a sufficiently complete description of old species for diagnostic purposes, I have not attempted detailed anatomical discussions. In the diagnosis of old species, and in matters of general classification, I have followed very closely Mayer's monumental work, The Medusae of the World. Full synonymies of previously described species will be found in that work.

Mayer describes 20 species and varieties of Scyphomedusæ which have been reported from the Philippines. The fact that all but one of these were reported for the first time from the *Albatross* collection made during the years 1908 to 1910 shows how little attention has been paid to the collecting of Scyphomedusæ in Philippine waters. The present paper adds 9 species and varieties, making a total of 29 species and varieties of Scyphomedusæ from the Philippines. A list of these, with localities when known, follows.

1. *Carybdea rastonii* Haacke, Luzon and Mindoro [Mayer, 1910].
2. *Carybdea alata* Reynaud var. *moseri* Mayer=*Charybdea philippina* Haeckel [Semper, 1860].
3. *Chiropsalmus quadrigatus* Haeckel, common [Mayer, 1910] [Light, 1914].
4. *Periphylla hyacinthina* Steenstrup forma *dodecabostrycha* (Haeckel) Mayer [Mayer, 1910].
5. *Linuche aquila* (Haeckel) Mayer, Mactan [Mayer, 1910].
6. *Atolla bairdii* Fewkes forma *valdiviæ* Vanhöffen, Albatross station 5202 [Mayer, 1910].
7. *Atolla wyvillei* Haeckel, Albatross station 5201 [Mayer, 1910].
8. *Pelagia panopyra* Péron and Lesueur var. *placenta* (Haeckel) Mayer [Mayer, 1910].
9. *Dactylometra quinquecirrha* L. Agassiz, "*Chrysaora* stage," Manila Bay [Light, 1914].
10. *Sanderia malayensis* Goette, Sulu Sea [Mayer, 1910].

11. *Discomedusa philippina* Mayer, Catingan Bay [Mayer, 1910].
12. *Aurellia labiata* Chamisso and Eysenhardt, Masbate [Mayer, 1910], Palawan and Manila Bay [Light, 1914].
13. *Cassiopea polypoides* Keller var. *culionensis* Light, Culion Bay, Culion [Light, 1914].
14. *Cassiopea medusa* Light, Culion Bay, Culion [Light, 1914].
15. *Cassiopea ornata* Haeckel, Simaluc Islands, Subic Bay, Luzon and Samar [Mayer, 1910].
16. *Cephea cephea* (Forskål) Mayer, Mariveles [Light, 1914].
17. *Cephea octostyla* L. Agassiz, Jolo [Mayer, 1910].
18. *Catostylus purpurus* Mayer, Manila Bay [Mayer, 1910] [Light, 1914].
19. *Lychnorhiza bartschi* Mayer, Jolo [Mayer, 1910].
20. *Mastigias papua* L. Agassiz, Mindoro and Palawan [Light, 1914].
21. *Mastigias ocellata* Haeckel [Mayer, 1910].
22. *Versura maasi* Mayer, Bohol [Mayer, 1910].
23. *Lobonema smithii* Mayer, Manila Bay [Mayer, 1910].
24. *Lobonema mayeri* Light, Malampaya Sound, Palawan and Manila Bay [Light, 1914].
25. *Lobonemoides gracilis* Light, Palawan [Light, 1914].
26. *Acromitus maculosus* Light, Palawan [Light, 1914].
27. *Thysanostoma thysanura* Haeckel, Mindanao and Mindoro [Mayer, 1910].
28. *Lorifera flagellata* (Haeckel) Mayer, Albatross station D. 5226 [Mayer, 1910.]
29. *Rhopilema visayana* Light, Palawan [Light, 1914].

IMMATURE FORM

Cassiopea polypoides Keller (?), Port Galera Bay, Mindoro [Light, 1914].

Order CARYBDEIDÆ

Genus CHIROPSALMUS L. Agassiz, 1862

Chiropsalmus quadrigatus Haeckel.

The bell is dome shaped and 4-sided, with an evenly rounded aboral surface. Four laterally flattened, hand-shaped, interradial pedalia arise from the sides of the bell a short distance above the velar margin. Each bears from 5 to 9, typically 7, finger-shaped projections, each of which gives rise to a very long, slender, flexible, hollow tentacle banded with nematocysts. There are 4 perradial sense clubs in covered notches in the sides of the bell, a little above the level of origin of the pedalia. A distinct velarium supported by a bracketlike, perradial frenulæ stretches partly across the mouth of the bell cavity. The central stomach is short and wide, with 4 lanceolate lips with simple margins. From each of the flattened perradial sides of the stomach arises a pair of gastric saccules which project downward into the bell cavity. Each saccule is laterally flattened and cockscomb shaped with an irregularly notched margin.

This distinguishes the medusa from C. *quadrumanus*, the most nearly related form, which has finger-shaped saccules.

This medusa was very abundant in Taytay Bay, Palawan, and in Culion Bay, Culion, in May and June, 1913. Numerous specimens were obtained, including many immature forms. They agree exactly with Mayer's description of specimens collected in Philippine waters by the *Albatross*. Much larger specimens were seen than any as yet reported, some in Culion reaching a diameter of at least 200 mm. There are 7 tentacles to each pedalium in by far the greater number of specimens, and these tentacles show in life narrow, lavender bands of nematocysts. The tentacles are very long, slender, and flexible, reaching a length of 1.5 meters or more. They are very delicate, and usually break off and remain attached to the clothing or the body when encountered in the water.

The sting of this medusa is very dangerous. One of the women in the party of the expedition to Palawan, who was stung while in bathing, was very seriously ill. I have described the symptoms more in detail in another place.[2] Swelling and inflammation began almost immediately in the areas which came in contact with the tentacles, and later blisters formed along the lines marked by contact with the tentacles. The lower limbs became swollen, the heart action was impaired, respiratory spasms and nervous twitchings of the muscles ensued, and the patient experienced intense general pain. The natives of Palawan reported a number of deaths caused by the sting of this medusa.

Mayer reports this medusa in the *Albatross* collection from Masbate, Luzon, and Mindanao, and I have found it plentiful in Culion and Palawan, from which it may be seen that it has a wide range in the Philippines.

Family PELAGIDÆ

Genus **DACTYLOMETRA** L. Agassiz, 1862

Dactylometra quinquecirrha L. Agassiz, "*Chrysaora* stage."

At certain seasons of the year, particularly in October and November, this medusa is found in large numbers in Manila Bay where it is a menace to bathers and fishermen who hold it in great fear. While all the specimens which I have seen have shown only 24 tentacles and 32 marginal lappets and many of them are apparently sexually mature, this medusa agrees so closely in every other respect with *D. quinquecirrha* that I have considered it as the "*Chrysaora* stage" of that species, corresponding to the similar "*Chrysaora* stage" of the species found in the bays of the Atlantic Coast of the United States.

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[2] *This Journal, Sec. B* (1914), 9, 291.

The flatly rounded bell is from 70 to 100 mm. in diameter. There are 24 marginal tentacles of about equal length. In life, these reach a maximum length of almost a meter. In preserved specimens, they are seldom perfect and are much contracted, not usually exceeding a length of twice the bell diameter. There are 32 bluntly rounded marginal lappets, and the 2 next the sense organs in each octant are usually about one-half as wide as the 2 between the tentacles. The sense organs are marked by shallow notches in the margin. They are covered above by a shelf of tissue nearly twice as wide as the length of the sense club. Below they are exposed, but lie in deep narrow furrows. The mouth arms are complexly folded, presenting along their edges regular pairs of extended points. They are from two to three times as long as the bell radius in preserved specimens and many times as long in life. The umbrella is transparent white, and is covered on the exumbrellar surface with tiny, semiopaque, white spots. The 16 stomach pouches are semiopaque, the dividing membranes entirely transparent, and the exumbrellar radial muscle strands opaque white. The gonads are light yellow, light brown, or yellow with a lavender tinge, the inner edges of the oral palps are light transparent pink to light lavender brown, and the tentacles are opaque white.

This medusa is known to be very dangerous. The natives call it *fosforo* ("match" in Spanish). This name is used by the fishermen, because the long oral arms suggest the stick and the bell the head of a match. I have heard of several cases of severe poisoning from this medusa both among natives and Americans. The native remedy is sugar solution taken internally and external applications of vinegar.

Old [3] has reported a number of cases of poisoning from jellyfish in which there was a definite symptom complex differing from that in the case of poisoning by *Chiropsalmus quadrigatus* already mentioned. Mayer [4] cites Doctor Smith [5] as considering that these cases of poisoning were due to the sting of *Lobonema smithii* Mayer. It seems more probable that they were due to *Dactylometra*, since it is so common in the bay and is the form commonly considered to be poisonous by the natives, especially the fishermen. I have not seen *L. smithii*, but the sting of *L. mayeri* sp. nov., a closely related form, while unpleasant is not dangerous. I hope to be able to report more fully on this matter in the future.

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[3] *This Journal, Sec. B* (1908), 3, 329.

[4] *Pub. Carnegie Inst. Wash.* (1910), No. 109, 3, 690–691.

[5] Dr. Hugh M. Smith, deputy United States fish commissioner.

Order SEMÆOSTOMEÆ

Genus **AURELLIA** Péron and Lesueur, 1809

Aurellia labiata Chamisso and Eysenhardt.

The margin is divided into 16 velar lobes. The bell margin projects downward from the subumbrellar side as a velumlike membrane, forming a fold between each 2 sense organs. The tentacles and marginal lappets have moved a considerable distance up the sides of the exumbrella. The subgenital ostia are very small.

This seems to be a rather widely distributed form in Philippine waters, as Mayer reports it from Masbate from specimens in the *Albatross* collection and we have specimens from Taytay, Palawan, and Manila Bay. We have 4 specimens in our collection, 2 collected by Dr. R. P. Cowles in Taytay, Palawan, and 2 from Pasay Beach, Manila Bay. They all show the 16 notches in the bell margin, the velumlike subumbrellar membrane marking the true margin, and the very small subgenital ostia which characterize *A. labiata,* so I have considered them as belonging to that species in spite of rather marked individual differences and differences in proportion as compared with other specimens whose measurements are given by Mayer.

The smallest specimen (D in the table) is relaxed, flabby, and without definite shape. The bell is only 10 mm. thick at the base of the mouth arms, and the whole medusa has the appearance of having completely relaxed in death. The marginal tentacles are very slender and flexible, and are from 12 to 15 mm. in length.

In another specimen (B in the table), the bell thickness at the base of the mouth arms is 25 mm. The material of the umbrella has a very solid, stiff consistency, and is thick up to the tentacle zone. It appears to be in a state of contraction, and nearly all the marginal tentacles are tightly contracted. The velumlike margin is here represented only by a very slight fold which has the appearance of a line connecting the sense organs. The thick bell with a solid consistency and the rounded genital pouches and small ostia give it a resemblance to *A. solida* Browne. Owing to the condition of the specimen, it was impossible to determine the arrangement of the sense organs, but the 16 velar lobes show that the medusa is *A. labiata.*

Measurements of Aurellia labiata.

Specimen.	Diameter of the umbrella.	Diameter across the zone of gonads.	Length of each mouth arm.
	mm.	*mm.*	*mm.*
A	225	107	100
B	167	86	71
C	150	65	----------
D	145	50	55

Order RHIZOSTOMÆ

RHIZOSTOMATA PINNATA Vanhöffen

Genus **CASSIOPEA** Péron and Lesueur, 1809

Cassiopea polypoides Keller var. **culionensis** var. nov. (fig. 1).

Type.—No. C. 2420, zoölogical collection, University of the Philippines.

The disk is flat, from 120 to 150 mm. in diameter, with a broad, shallow sucker cavity and a central thickened area. The thickened outer margin of the sucker cavity is from 15 to 20 mm. from the margin of the bell, and the diameter of the sucker is about two-thirds of the bell diameter. The margin is thin and divided into from 16 to 20 parameres by as many sense organs. There are twice as many radial canals as sense organs, and there is no ring canal. Each paramere has 5 blunt marginal lappets, the lappet in the center of each paramere being the largest, the 2 ocular lappets being about one-half as wide as the 2 on each side of this central lappet. The sense organs show no pigment spot. The mouth arms are from 1.25 to 1.5 as long as the bell radius, and project considerably beyond the bell margin. They are cylindrical or somewhat dorsally flattened in their proximal portions and higher than broad in their distal portions. The arms give rise in their proximal portion to about 3 pairs of short, alternately arranged lateral branches beyond which the arm divides to form from 3 to 5 long branches which may in turn subdivide. There are numerous, small, berrylike vesicles between the mouths over the entire surface of the arms. In most specimens, there is a central flattened appendage in the center of the arm disk

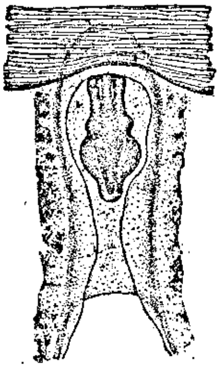

FIG. 1. *Cassiopea polypoides* Keller var. *culionensis* var nov., a sense organ from the subumbrellar side. Much enlarged.

surrounded by a whorl of smaller similar appendages. This central appendage reaches a length of 30 mm. and a width of 40 mm. The arms may have toward their distal ends a number of ribbonlike or leaflike appendages, reaching a length of 20 mm. and a width of from 8 to 15 mm. Of the 27 specimens in the collection, 10 have the large central appendage and a whorl surrounding it, 11 have a large central appendage without a surrounding whorl, 3 have no enlarged appendage, and 3 have enlarged appendages on the arms but none in the center of the disk.

The central stomach is circular in outline, and is encroached on from below by the 4 gonads. Twice as many radial canals as sense organs originate from it and extend to the margin, giving off branches which form a very complex network of anastomosing vessels. The rhopalar canals increase in size toward the margin, while the interrhopalar canals become small distally.

In preserved specimens the umbrella is light olive green. On close examination dull white bands may be seen running to each sense organ. The mouth arms usually exhibit 3 color zones: A central circular area which is yellow, a zone composed of the portions of the arms projecting beyond the disk which is also yellow, and between these zones a zone of green. The appendages are opaque white, and contain a network of canals, giving them a leaflike appearance. The color of the live medusa is very similar to that of the preserved specimens.

Measurements and numbers of sense organs and of marginal lappets to a paramere of 14 specimens from Culion.

Specimen No.	Diameter of the bell.	Diameter of the arm disk.	Length of the mouth arms (from the center of the arm disk).	Sense organs.	Marginal lappets to a paramere.
	mm.	*mm.*	*mm.*		
1	121	50	95	20	5
2	129	58.5	89	20	5
3	120	55	90	16	5
4	128	58	99.5	20	5
5	145	57	104	19	5
6	130	58	112	17	5
7	130	60	99	20	5
8	143	50	102	19	5
9	151	79	145	17	5
10	145	62	120	17	5
11	145	63	114	16	5
12	154	63.5	176	19	5
13	118	60	95	18	5
14	150	60	120	16	5

The museum has 27 specimens of this new variety of *C. polypoides* collected by Dr. L. E. Griffin and Mr. L. D. Wharton in Culion Bay, in October, 1911. They were present in great numbers in the bottom of a boat slip near the Leper Colony pier. I found them in the same place in May, 1913, and Dr. Ernest Clements, the superintendent of the Leper Colony, tells me that they are nearly always to be found there. This boat slip is from 1 to 2 meters deep, is protected from storms, and has a sandy bottom; it seems to be an ideal habitat for the medusæ. They were all found lying with the exumbrellar surface downward and looked, as Keller[6] has remarked of *C. polypoides* forma typica in the Red Sea, extraordinarily like some large sea anemone. They are able to retain their hold firmly by means of the sucker cavity. Indeed, when the preserved specimens are placed with the exumbrella down in a glass dish, it is practically impossible to turn them over by lifting on the arms and arm disk. The living medusæ on being turned over immediately begin to pulsate. At each contraction, the arms of one side are pulled farther in and bent upward thus lifting the disk on that side. A final pulsation causes it to fall over on the exumbrellar surface, the pulsations cease, and the arms and margin are slowly adjusted.

This medusa resembles *C. polypoides* forma typica in general appearance, in the number of lappets to a paramere, in the length and branching of the mouth arms, in the canal system, and to some extent in the coloring. While it differs in some particulars, such as in the shape of the central stomach and the lack of pigmentation in the sense organs, I do not consider these differences sufficient to warrant the making of a new species in a genus which contains so many intergrading forms, and so I have considered it as a new variety of *C. polypoides* to which I have given the name *culionensis* as Culion seems to be a constant habitat of the medusa.

In coloration of the bell and in the arrangement of the appendages of the mouth arms, this form approaches most nearly to Keller's color variety "rosæ."

Cassiopea polypoides Keller (?).

One immature medusa collected in Port Galera Bay in May, 1912, differs from *C. polypoides* var. *culionensis* in having pigmented eyespots, in that the arms do not project beyond the bell margin, and in the arrangement of the appendages of the mouth arms. It has besides the berrylike vesicles a small central appendage, surrounded by a double whorl of 8 appendages, 2 in the axil between each two arms supported by the same interostial pillar. The appendages of the inner whorl are smaller than those of the outer whorl. Near the distal end of each arm is a large ribbonlike appendage reaching a length of 15 mm. and a width of 4 mm., which is surrounded by a number of similar but smaller appendages. Besides these, there are scattered among the mouths a number of small leaflike appendages.

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[6] *Zeitschr. f. wiss. Zool.* (1883), **38**, 634.

The entire medusa is, in formalin, a dull grayish white.

Measurements of the specimen in millimeters: Diameter of the bell, 55; diameter of the arm disk, 25; length of the mouth arms (measured from the center of the disk), 26. Number of sense organs, 17; number of lappets to a paramere, 5.

While this is probably an immature individual of *C. polypoides* forma typica, it is impossible to place it definitely, so I have indicated it as a doubtful immature example of that species.

Cassiopea medusa sp. nov. (figs. 2 and 3).

Type.—C. 2421, zoölogical collection, University of the Philippines, from Culion Bay, Culion.

The disk is flat with a broad, shallow sucking surface bounded externally by a circular raised area and having a broad thickened central disk. The disk measures 260 mm. in diameter, the sucking surface 180 mm., and the raised central disk 115 mm. The raised margin of the sucking surface is 15 mm. wide, and its outer edge is 25 mm. from the bell margin.

There are 17 sense organs, and each paramere contains 7 irregular, very blunt marginal lappets which are often more distinct as spaces between grooves in the exumbrella than as actual lappets in the very thin and nearly smooth margin. The sense organs are very small, slender clubs hidden in deep clefts. They are covered above by a shelf of exumbrellar tissue, but they are quite distinct from the subumbrellar side. They are without pigmented eyespots. The 8 large mouth arms arise from an 8-sided arm disk 114 mm. in diameter. They are 170 mm. in length, send off numerous small lateral branches in their proximal portion, and divide distally into 3 main branches, which are again subdivided. The mouths and branches are much more scattered than in *C. polypoides,* and arising in the axils of the branches and between the mouths from the center of the disk to the distal ends of the branches are hundreds of transparent appendages. These appendages are of two types which graduate into one another—a small, inconspicuous, ribbonlike form and a large, very flexible form, cylindrical at the base, flattened toward the outer end, and containing a broad central canal. These reach a length of 110 mm. and a diameter of 7.5 mm., giving the animal an appearance remarkably suggestive of the classical Medusa, hence the specific name. The canal system consists, as usual in the genus, of an equal number of ocular and interocular canals. The former run to the sense organs at the margin, while the latter break up into branches some distance inside, which anastomose with those from the ocular canals to form a network of canals running out to the margin. The subgenital ostia are small and considerably longer than broad as opposed to *C. polypoides*.

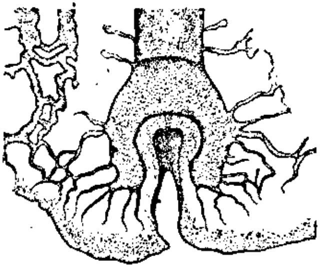

FIG. 2. *Cassiopea medusa* sp. nov., a sense organ and the adjacent canal system from the subumbrellar side. Very much enlarged.

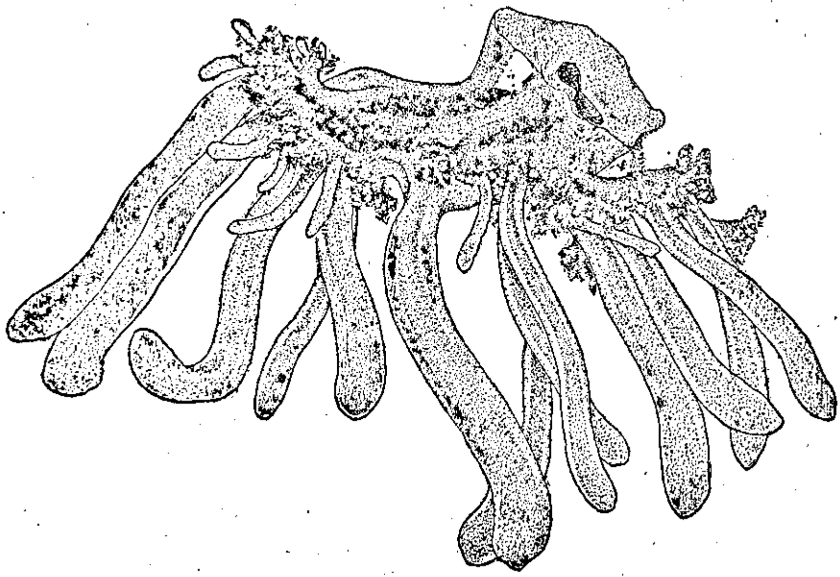

FIG. 3. *Cassiopea medusa*, a portion of a mouth arm, showing the scattered mouths and the very typical appendages. × 1.

In the preserved specimen the disk is opaque white with a slight grayish or greenish tinge. The mouths are light yellow, the arms and appendages are transparent white, and the canals are outlined in semiopaque white.

This very interesting and distinctly new *Cassiopea* is represented by a single specimen collected by Dr. L. E. Griffin and Mr. L. D. Wharton in Culion Bay, where it was found with *C. polypoides* var. *culionensis*. It is most nearly related to *C. polypoides* and *C. xamachana*, but it is differentiated from them as from all other species by the numerous very large appendages, by its very large size, and by the combination in one medusa of the following characteristics: 7 lappets to a paramere, mouth arms longer than the bell radius, and an unpigmented sense organ.

Owing to the extreme fragility of the specimen, it is impossible to make as complete a description as might be desired.

RHIZOSTOMATA DICHOTOMA Vanhöffen

Genus CEPHEA Péron and Lesueur, 1809

Cephea cephea (Forskål) Mayer.

I have a single worn specimen of this widely distributed species collected at Mariveles, Manila Bay, in January, 1912. It is undoubtedly a form of *Cephea cephea* as shown by the deep clefts of the sense organs and the high, heavily warted central dome. The bell diameter is 220 mm., and the distance from the lower surface of the arm disk to the top of the dome is 120 mm. The 8 mouth arms arise in 4 pairs. Each arm is shorter than the bell radius, and shows decided lateral compression in the proximal portion. The two outer branches are considerably stouter than the inner branches. The mouths are borne only on the faces of the main branches and their subbranches. Scattered among the mouth arms are numerous short, ribbonlike, narrow appendages which when contracted have a berrylike appearance. These reach a maximum length of 40 mm., most of them being from 10 to 20 mm. in length. There is a very conspicuous set of folded ridges containing the radial muscles and extending from the arm disk to the ring canal, which is about 50 mm. from the margin. On these ridges are numerous very small, flexible, cone-shaped projections. The circular muscles which are also distinct folds lying between the ring canal and the margin are interrupted, partially at least, in the rhopalar radii. The canal system agrees with that given by Mayer for *Cephea cephea*, except that the ocular canals are considerably wider, in their distal portion at least, than are the interocular canals. The subgenital ostia are small, half-moon shaped, convex below, and concave above.

The central dome of the exumbrella is 80 mm. high and about 70 mm. in diameter. It is covered at the bottom with small granular warts. Toward the top, these increase in size, reaching at the apex a length of 18 mm. and a diameter of 14 mm. They are irregular, and may be slender and pointed or irregular and massive.

The margin is not in a good state of preservation, but there are evidently 8 sense organs, which lie in deep notches, and about 80 marginal lappets—8 velar and 2 ocular between each two sense organs. The lappets show very plainly as thickenings of the gelatinous material, but are not distinct at the edge where they are joined by a web. The dome is transparent rosy pink, shading to light blue at the apex.

RHIZOSTOMATA TRIPTERA Vanhöffen sensu Maas

Genus **CATOSTYLUS** L. Agassiz, 1862.

Catostylus purpurus Mayer.

The disk is somewhat flatter than a hemisphere in preserved specimens, but more convex than a hemisphere in life. The exumbrella is smooth. The 8 rhopalia are flanked by short, narrow, bluntly rounded lappets. In each octant there are 4 cleft and 2 simple velar lappets; in all, 10 velar terminal lappets to an octant. In the whole bell there are 96 marginal lappets, 16 rhopalar, and 80 velar terminal lappets. In any octant the velar lappets are arranged as follows: One cleft lappet, 1 simple lappet, 2 cleft lappets, 1 simple lappet, and 1 cleft lappet.

The arm disk at the base is about half as wide as the bell diameter, and is much smaller at the level of origin of the mouth arms. The long, narrow genital ostia are nearly as wide as the interostial pillars. They are constricted by a thick, wide median projection which extends from the arm disk. A long finger-shaped or swollen papilla is seen on the subumbrellar surface. It arises on the outer margin of the ostia in the line of the rhopalar canal. The subgenital porticus is unitary and cruciform.

The mouth arms are from 0.75 to 1.25 as long as the bell radius, and the mouths extend to the extreme tip of each arm. In living specimens, particularly those that are immature, a considerable part of the mouth arms is covered by edges of the bell. In preserved specimens the bell is flattened and the edges are turned in, leaving the mouth arms exposed.

The circular muscles extend uninterruptedly from the arm disk to the margin, being most prominent between the circular canal and the margin.

Sixteen radial canals, 8 of which are rhopalar and 8 adradial, leave the cruciform central stomach. The ocular canals extend past the ring canal to the sense organs, while the adradial canals end in the ring canal. The fine-meshed network of canals outside the ring canal extends to the margin. The coarser inner network is always connected with the adradial canals, seldom with the ocular canals, and never with the stomach.

The sense organs have in life brilliant silver spots which fade in preserved specimens. The size of these ocelli is in inverse ratio to the size of the medusa.

The medusa is deep purplish brown in life, and fades to dull brown in formalin.

This is the commonest medusa of Manila Bay. During the months of November and December it is especially abundant on the beach at Pasay just outside of Manila. The fishermen say that these jellyfish are blown in by southwest winds which prevail during these months. The largest specimen in the collection measures 105 mm. in bell diameter, but I have seen many considerably larger specimens. Mayer reports this species as living on the bottom in shallow water. I hardly think this is the case, as they are always to be seen on or near the surface in shallow water along the beach and in the esteros (brackish water canals), where they sometimes occur in countless numbers. The immature medusæ vary considerably. Some are transparent white, and resemble in general appearance the immature forms of *Acromitus maculosus* gen. et sp. nov. which is described later in this paper. The chief and most apparent difference is, of course, the absence of appendages of any kind on the mouth arms of *Catostylus*. Others resemble in general form the mature medusæ, but have such striking differences that I have thought it worth while to give a short description of one of them.

Catostylus purpurus Mayer, immature form.

The bell, which measures 27 mm. in diameter, is more convex than a hemisphere when relaxed and much more so in contraction. The margin in life hangs down below the short mouth arms, but in formalin is curved inward exposing the mouth arms. There are 8 prominent rhopalia, which in life have a bright silvery color. The exumbrellar sensory pit is broad and shallow and dendritically grooved. The ocular lappets are roundly pointed and longer than the velar lappets. There are typically 10, sharply pointed, narrow, velar lappets between each 2 ocular lappets arranged as in the adult medusa.

The subgenital ostia are irregular in size and from once to twice as wide as the interostial pillars. The genital porticus is unitary and cruciform. The circular muscles extend uninterrupted from the outer end of the arm disk to the margin.

The arms are 6 mm. long. Each has a swollen area near the base, culminating on the outside in a laterally projecting point beyond which the arms are decidedly narrowed. The mouths are on the lower and inner surfaces of the three branched arms.

In life, the medusa is deep, rich plum; in formalin, it is purplish brown.

This immature form was collected from a seine at Pasay Beach, Manila Bay, October, 1913. It is particularly interesting, because of the presence under the edge of the margin of several small cyclopslike crustacea, evidently leading a commensal existence. Four of these crustaceans were found, each lying just below a sense organ and along the line of a rhopalar canal, the head end lying innermost. They were all females with well-developed egg sacks, and were difficult to make out in position as they have many minute brown pigment spots scattered over the body, giving them the same general color as the medusa.

I have since found that these crustacea are to be found in great numbers on living specimens whether mature or immature and are not confined to any one region of the medusa.

Genus **MASTIGIAS** L. Agassiz, 1862

Mastigias papua L. Agassiz.

There are 3 immature and 2 mature specimens of this medusa in the collection from Port Galera Bay, Mindoro, collected during May and June, 1912. I saw many small specimens in Taytay Bay, Palawan, in May, 1913.

These forms differ somewhat from the typical *M. papua*, and while these differences coincide to some extent with those noted in *M. papua* var. *sibogæ* Maas they differ to about the same extent. They seem to be intermediate in form between *M. papua* var. *sibogæ* and *M. papua* forma typica, and the specimens differ among themselves as to coloration, length of filaments, etc. These facts lead me to believe, as Mayer says, that there are numerous very closely related or even intergrading forms in this genus. It would be interesting to compare large series of these medusæ from localities joining two rather widely separated habitats, say Japan and Papua, getting series from Japan, Formosa, Luzon, Mindanao, Jolo, Amboina, and Papua. I have no doubt that the individuals of such a series would so intergrade as to make it necessary to consider them as local forms of a single very variable species.

The largest specimen in the collection measures 60 mm. in bell diameter, and the arm disk is 33 mm. in diameter. The arms measure 35 mm. in length from the center of the arm disk, and project only slightly beyond the edge of the disk. There are 8 rhopalia, with large, cup-shaped, pigmented ocelli and long, pointed, ocular lappets. Between each 2 sense organs are 9 rounded or bluntly pointed velar lappets. The subgenital ostia are three times as wide as the interostial pillars. There are 7 anastomosing interocular canals in each octant. The rounded clubs are scattered on the mouth arms, and the terminal appendages which are somewhat less in length than the bell diameter are distinctly 3-sided and show a network of internal canals. The general color in life is light greenish blue, shading into light brown, purple, or olive green. The exumbrella is covered, particularly in the mature medusa, with prominent white spots. Those above the ring canal are double-headed or dumb-bell shaped. The rhopalar canals are outlined by a broad violet or deep blue band. The arm clubs are violet or blue at the tip and base with intermediate zones of olive green, gray, and white. In preserved specimens the colors fade with the exception of the violet band on the circular canal, which is not present in some immature medusæ, and the violet bases of the terminal appendages.

Genus **ACROMITUS** novum[7]

Generic characters.—Rhizostomata triptera with scattered filaments and axial, terminal, filamentous appendages on the oral arms. The cruciform stomach gives rise to 16 radial canals, 8 of which are rhopalar and 8 adradial and inter-rhopalar. The rhopalar canals extend beyond the ring canal to the margin, while the adradial canals end in the ring canal. Externally, the ring canal sends off many small canals which anastomose and form a network between the ring canal and the margin. Internally, it gives off several larger canals on each side of each rhopalar canal which anastomose and join the rhopalar canals. The exumbrellar sensory pits show radiating furrows. The subgenital porticus is unitary and cruciform. The circular muscle is partially interrupted in the rhopalar radii.

The type species is *A. maculosus* sp. nov. from Taytay Bay, Palawan.

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[7] ἄκρος, at the point, terminally; μίτος, a thread.

The genus *Acromitus* is most closely related to *Catostylus* on one hand and less closely to *Lychnorhiza* and *Crambione* on the other. It resembles *Catostylus* in its canal system, the shape and structure of its mouth arms, and in the presence of furrows in the sensory pit, but differs from it in having filaments and an axial terminal appendage on each mouth arm.

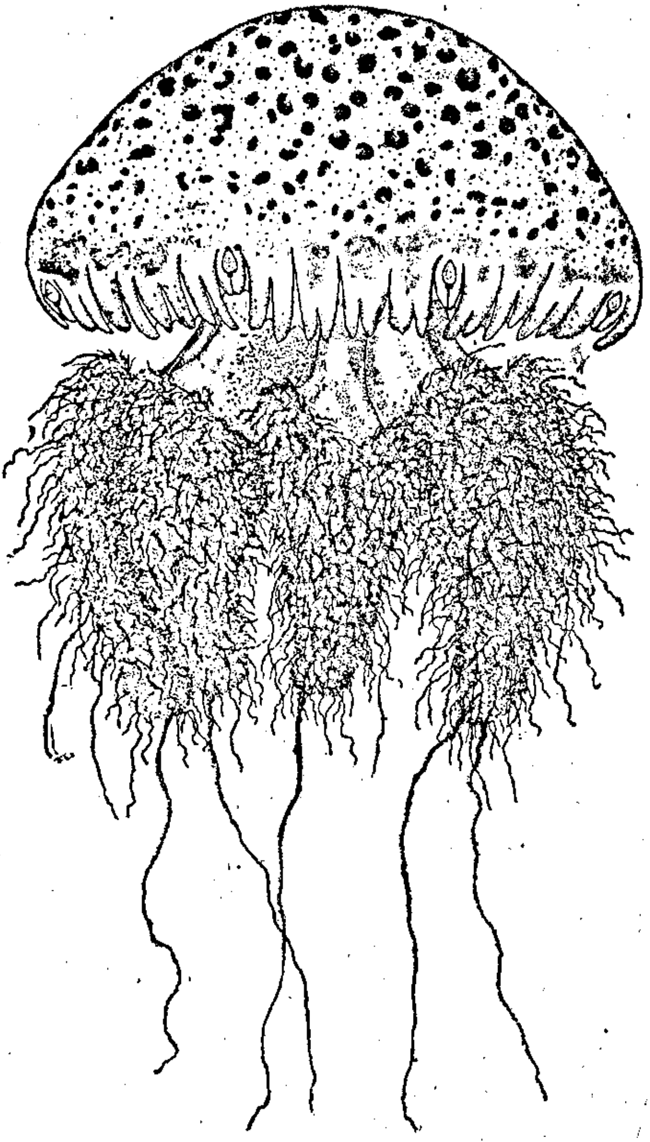

FIG. 4. *Acromitus maculosus* gen. et sp. nov., lateral view of the medusa. × 8/9.

While resembling *Lychnorhiza* and *Crambione* to some extent in its canal system, in having filaments on the mouth arms and in the presence of radiating furrows in the sensory pits, it differs from them in having an axial terminal appendage, in that the internal branches of the ring canal join the rhopalar canals, and in that the circular muscles are interrupted, partially at least, in the rhopalar radii. It differs from *Mastigias* in that the exumbrella sensory pit is furrowed, in that the interocular canals are regular in number (8) and in position and do not anastomose, running directly from the central stomach to the ring canal, and in that the axial terminal appendages of the mouth arms are long, slender filaments and not clubs. It differs from *Pseudorhiza* in having slender terminal appendages, in the presence of filaments on the mouth arms, in that the sensory pits are furrowed, and in the absence of a central mouth. It differs from *Phyllorhiza* in having axial terminal appendages and in that the inner branches of the ring canal do not reach the stomach. It differs from *Versura* in that the interradial canals are separate and in the presence of a definite ring canal. It differs from *Lobonema* most strikingly in the small size of the marginal lappets and in the absence of windowlike apertures in the oral arms. It differs from *Lobonemoides* gen. nov. in that there are not more than 8 rhopalia, in that the interocular canals do not extend to the margin, and in that the axial, terminal appendages of the mouth arms are filamentous.

Acromitus maculosus sp. nov. (figs. 4, 5, and 6).

Type.—No. C. 2081, zoölogical collection, University of the Philippines.

The bell reaches a width of 90 mm. or more, and is hemispherical or somewhat flatter than a hemisphere. It has a solid consistency, being thick in the central region and thin outside the ring canal. The surface of the exumbrella is covered with minute, bluntly cone-shaped projections. There are 8 rhopalia, each with a pigmented area and a deep, triangular, grooved, exumbrellar sensory pit. The marginal lappets are typically 80 in number—8 pointed velar lappets in 4 pairs and 2 narrow pointed ocular lappets being present in each octant. The grooves between the pairs of velar lappets are deep, and extend some distance up on the exumbrellar surface. The arm disk is about 1.2 or 1.25 of the bell radius. The genital ostia are from 1.3 to 1.5 as wide as the column between them. They have a regular but sinuous outline, and are partially closed by a median flaplike projection from the outer margin. The subgenital porticus is cruciform and unitary.

The mouth arms vary in length from 1.3 to twice the bell radius. The proximal area, in the adult, is about 0.25 of the arm length and considerably more in the immature medusa. It is narrow and unbranched, and bears mouths only on its inner side where they extend to the center of the arm disk. The distal portion has the shape of a 3-cornered pyramid, the branches of the wings of the mouth arms extending alternately in opposite directions. The mouths are found only on the outer surfaces of the secondary branches of the three main divisions of the mouth arms, but these branches are so elongated laterally as to cover the bare spaces between the branches and present in all directions a surface composed of fringed mouth openings interspersed with filaments. The capitate tentacles fringing the mouths are very numerous and heavily loaded with nematocysts. The filaments are covered with large nematocyst warts, giving them a knobbed and knotted appearance. The filamentous axial terminal appendages are about as long as the mouth arms and very flexible. They contain a central canal, and are covered with nematocyst warts considerably smaller than those of the other filaments. The central ducts of the mouth arms join in pairs before passing into the stomach, the ducts of the two arms arising from a common interostial pillar uniting. Each of these 4 main ducts enters the outer end of a stomach pouch. The main duct of each mouth arm gives off about 6 small branches to the mouths of the upper portion of the mouth arm. At the point of origin of the two outer arm branches it gives off 3 main branches, one to each arm branch, and continues beyond that point to the tip of the mouth arm as a small central canal giving off a few small branches to each of the three arm branches and is continued as the central canal of the terminal filament. The canals to the two outer arm branches are broad and bifurcated near their outer ends.

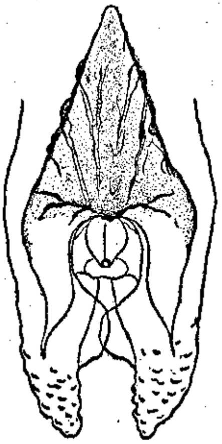

FIG. 5. *Acromitus maculosus*, an exumbrellar view of a sense organ; diagrammatic. Much enlarged.

The stomach is cruciform in shape, the 4 lobes tapering somewhat toward the outer ends. From the outer extremity of each lobe there are given off 3 radial canals, a central rhopalar canal and an ardradial canal on either side arising from the outer edge of the end of the lobe. In the cleft between each two lobes, a rhopalar canal is given off. So, of the 8 rhopalar canals, the 4 perradial canals—since they arise from the ends of the stomach lobes—are short and the 4 interradial canals—since they arise between the stomach lobes—are long. The 8 rhopalar canals extend straight to the sense organs, while the 8 interocular canals end in the circular canal. The area of the bell between the circular canal and the margin is filled with a network of anastomosing canals, taking their origin from the outer surface of the ring canal and intercommunicating with the branches of the rhopalar canals. Arising from the inner surface of the circular canal on each side of each ocular canal is a series of anastomosing canals usually 3 in number, which joins the ocular canals by a common lateral branch. This canal network has, typically, no connection with the interocular canals which run directly from the stomach to the ring canal without branching or anastomosis.

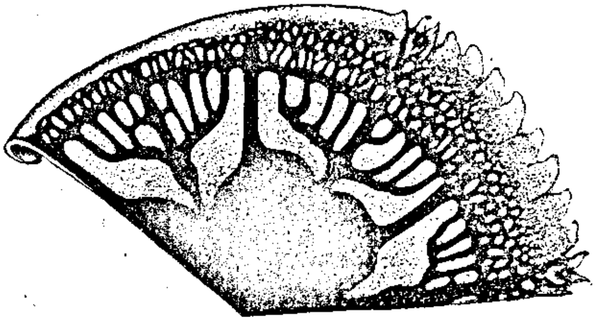

FIG. 6. *Acromitus maculosus*, an exumbrellar view of a portion of the bell, showing the canal system as seen when injected; somewhat diagrammatic.

There is a wide band of circular muscles covering the space between the margin and a line a little external to the level of the ends of the stomach pouches. The part of the muscle band lying within the ring canal is interrupted in the 8 rhopalar radii, while that outside the rihg canal is only partially interrupted.

The whole medusa is pale blue in life, the color being deepest along the radial canals and oral arms. The exumbrella is covered with circular, ring-shaped, solid, elongated, or irregular spots. In life, these are iridescent purplish black to dark brown. In specimens preserved in formalin, the blue fades to slightly opaque white with a faint bluish tinge and the spots fade to bronze brown and finally dissappear.

These medusæ were common in the shallow water along the beach at Taytay, Palawan, in April and May, 1913. Great numbers of immature forms were present the second week in May. They first appeared after a very severe wind storm of several days' duration, but were never noted in the deeper waters of the bay.

Measurements of the type specimen in the collection of the zoölogical department of the University of the Philippines, No. C. 2081.

	mm.
Bell diameter	90
Length of the mouth arms	60
Length of the bare proximal portion of the mouth arm	15
Diameter of the arm disk	50
Width of the inturned portion of the exumbrella	15
Diameter of the largest exumbrellar spots	5
Width of the subgenital ostia	20
Width of the interostial pillars	15

Numerous specimens of the different stages of this medusa were collected at Taytay, Palawan, in the summer of 1913 by Dr. R. P. Cowles and myself while on the joint scientific expedition of the University of the Philippines and the Bureau of Science. During the time in which they were numerous in the vicinity of Taytay, I visited neighboring islands and other parts of Palawan, but was unable to find the medusa.

Among the numerous immature specimens, some variations and abnormalities are to be noted. The time at which the spots appear on the umbrella seems to vary. Some specimens whose umbrella is but 15 mm. in diameter show distinct spots, while others which have reached a diameter of 40 mm. show no markings at all. In the immature forms, the spots are arranged in more or less circular groups of 4 or 5 which coalesce to form the large spots of the adult form. The proximal portion of the mouth arms is more prominent, and makes up a larger portion of the arms of the immature medusa. The canal system of the bell seems the same in mature and immature specimens, but the side branches of the upper portion of the main canals of the mouth arms are conspicuous in the immature forms. The canal pattern is strikingly brought out by injecting pure Delafield's hæmatoxylin through an opening in the center of the exumbrella. The only notable variation is that in a very few cases the inner canal network is connected to the adradial canals as well as to the interradial and perradial canals. This connection is very slight, and is by no means common. One specimen has 5 stomach lobes, 5 gonad lobes, 9 mouth arms, 18 radial canals—10 of them rhopalar and 8 adradial—and 96 marginal lappets. There are 9 rhopalia present, and as the margin is gone at the end of another rhopalar canal we may say there are 10 rhopalia, so it is as if a new area equivalent to a quadrant has been developed in this specimen to correspond to the extra stomach lobe, lacking, however, two adradial canals. In another specimen there are 18 canals, but 5 of them—3 adradial and 2 rhopalar—arise from a single enlarged stomach pouch. Another specimen has 10 mouth arms, 4 of them developing from a single interostial pillar, but the canal system is of the normal type. At first glance, the canal system of the bell of this species appears to be very similar to that of *Catostylus purpurus* Mayer, to which it is undoubtedly closely related. But in the injected specimens of *C. purpurus* it can be seen that the internal network of canals from the ring canal is connected most conspicuously with the adradial canals, while in *A. maculosus* it is connected with the rhopalar canals and typically not at all with the adradial canals.

I have given the species the name *maculosus*, as the spots on the umbrella constitute one of its most striking specific characters.

Genus **LOBONEMA** Mayer, 1910, emended.

Generic characters.—Rhizostomata triptera, in which the velar lappets are greatly extended, tapering to pointed ends. The mouth arms show numerous filaments, and the mouth-arm membranes are perforated by windowlike openings. There are from 8 to 16 rhopalia, twice as many radial canals as rhopalia, and a ring canal which gives off an anastomosing network of vessels on both its inner and outer sides. The inner network does not connect with the stomach. All of the radial canals extend beyond the ring canal, the ocular canals always to the sense organs. The subumbrella shows a well-developed system of ring muscles extending from the mouth-arm disk to the margin, interrupted partially or not at all by the radial canals. There are numerous prominent tapering papillæ upon the exumbrella. There is an exumbrellar sensory pit above each rhopalium, whose floor is covered with radiating dendritic furrows.

This is Mayer's original definition emended so as to include *Lobonema mayeri* sp. nov.

Lobonema mayeri [8] sp. nov. (figs. 7, 8, and 9).

Type.—No. C. 2424, zoölogical collection, University of the Philippines.

During the middle and latter part of May, Malampaya Sound on the west coast of Palawan contained great numbers of this very beautiful and interesting medusa. Two specimens were taken in as perfect a condition as was possible in the case of forms with such long and fragile arm filaments.

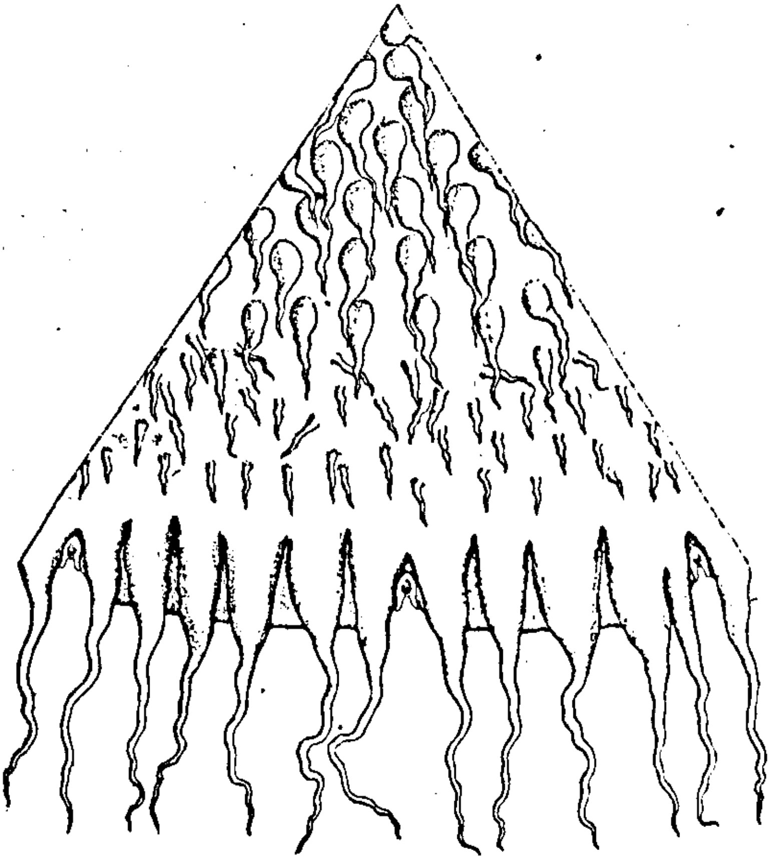

FIG. 7. *Lobonema mayeri* sp. nov., a quadrant of the exumbrellar surface, showing the papillæ, sense organs, and tentaclelike marginal lappets. × ½.

The bell is much flatter than a hemisphere both in preserved and living specimens. The portion of the bell beyond the ring

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[8] I have named this species in honor of Dr. A. G. Mayer without whose Medusae of the World the completion of this report would have been extremely difficult if not impossible and who (1910) described the genus *Lobonema* and the only other known species, *L. smithii* Mayer.

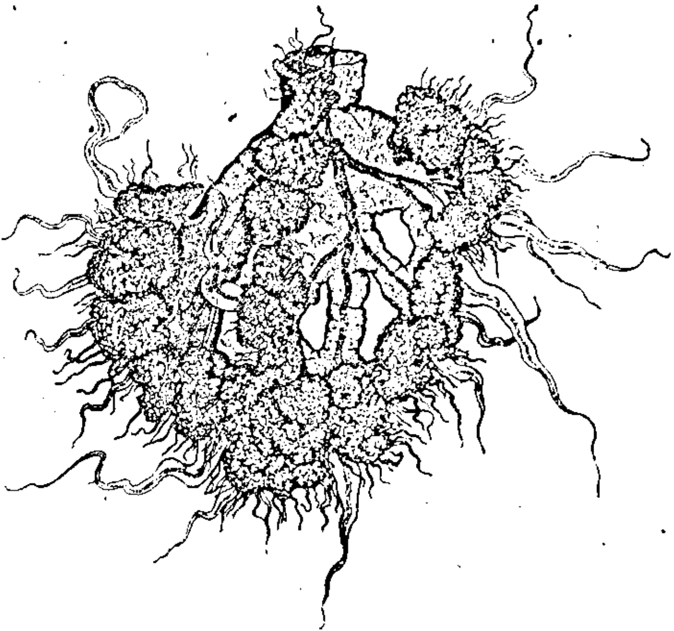

FIG. 8. *Lobonema mayeri*, a mouth arm, showing the appendages, the windowlike openings, and the irregular arrangement of the ducts; somewhat diagrammatic. × ⅓.

canal, which is a considerable distance from the margin, is very thin, and hangs down as a sort of fringe when floating. The bell is from 340 to 500 mm. in diameter measured from a sense club to the one 180° from it. Medusae having a diameter of at least 500 mm. and probably much more were very numerous. The subumbrella is covered with very flexible tapering papillæ, increasing in size and number toward the center of the exumbrella where they reach a length of 60 mm. and a basal diameter of 15 mm. Those in the center of preserved specimens are stiff and solid at the base, but their tips like the entire papillæ toward the outer position of the exumbrella are very soft, shrunken, and without rigidity. In life, they are all conical and flexible, waving about in the currents of water. Toward the center of the exumbrella, the rather broad bases of these papillæ cover the entire surface.

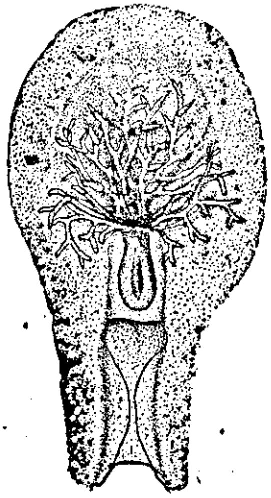

FIG. 9. *Lobonema mayeri*, a sense organ from the exumbrellar side. Much enlarged.

The 12 to 16 rhopalia are very short

with broad swollen ends, and are covered above and below by shelves of tissue, the exumbrellar shelf being very short and the subumbrellar much larger. No pigment spots are present. The exumbrellar sensory pit it small, rather deep below, and dendritically grooved. It lies in the surface of an oval, papillalike, raised area. The ocular lappets are short, plump, and closely approximated, being 4 mm. in length from the base of the exumbrellar sensory pit to the tip and 3 mm. in diameter. There are from 70 to 80 complete marginal lappets, from 3 to 6 in a paramere. Some of the lappets show a distal bifurcation. The lappets are elongated, tentaclelike, tapering to a point. They reach a length of 200 mm., measured from the inner end of the cleft, are very slender and flexible distally, and have the appearance of true tentacles. For about 25 mm. of their inner length they are joined by a web. They are concave below and convex above, with thin edges. They contain a number of large longitudinal canals joined by small lateral branches, and no muscle fibers could be detected in stained sections. The velar grooves of the exumbrella are about 25 mm. and the ocular grooves are about 12 mm. long. The rhopalar clefts are V-shaped rather than Y-shaped as in *L. smithii.* From 24 to 32 radial canals, half of them rhopalar and half interrhopalar, leave the central stomach. There are always half as many sense organs as canals. The ocular canals extend to the sense organs in the margin, but the interocular canals while extending for some distance beyond the ring canal are lost in the network of anastomosing canals before reaching the margin, differing in this character from *L. smithii.* This is well shown by injecting one of these canals with Delafield's hæmatoxylin. There is a distinct ring canal about 45 mm. inward from the sense club zone giving off an anastomosing system of canals internally and externally, which connects with both the ocular and interocular canals but not with the central stomach.

The bell between the arm disk and the ring canal is from 25 to 30 mm. in thickness, while from the ring canal to the margin it is not thicker than 10 mm. The thickest point is at the level of the ring canal, where there is a circular swollen subumbrellar area over which the radial canals curve to meet the ring canal whose greatest breadth is at right angles to the plane of the subumbrella. At this point, just before it joins the ring canal, there is a bulbous enlargement of each ocular canal.

There is no radial muscle. The circular muscles form a series of circular folds between the arm disk and the zone of the sense organs. That part of the muscle band which lies within the ring canal is completely interrupted in the ocular radii and thinned in the interocular, while that portion lying outside the ring canal is thinned in the ocular radii and only slightly so in the interocular radii.

The arm disk is two-thirds as wide as the bell radius, very thin in the center, and swollen and rounded along the outer edge. The subgenital ostia are compressed, are twice as wide as the interostial pillars, and have a small papillalike projection in the center of their subumbrellar lip. The subgenital porticus is unitary. The gonads are in the form of long lines in the thin reduplicated and folded wall of the stomach. On each side of these lines of reproductive organs are lines of blunt gastral filaments. These reduplicated membranes are inflated and pushed out through the subgenital ostia in the two specimens in the collection. Each of the interostial pillars contains a slitlike false ostium about two-thirds as wide as the pillar. One specimen examined had a large cone-shaped papilla on the upper margin of this false ostium, while others did not.

The supporting membranes of the 3 main branches of the mouth arms are pierced by windowlike openings. Typically, there seem to be 2 in the membrane of each wing, but the weakened arm membranes have broken down in most of the arms. In no arm are there more than 2 in each wing, in some none at all, and in others the branch is only attached by its upper edge, the membrane between the openings having given away. The mouth arms are equally spaced, the two arms arising from the same interostial pillar being widely separated, the base of each extending partly over the adjacent subgenital ostium. The proximal portion of each arm is about one-half the length of the 3-winged distal portion. The fringed mouths extend on the inner surface to the center of the arm disk. Scattered among the mouths are very numerous filaments. Those of the central disk and the proximal portion of the arms are slender, threadlike filaments. Toward the distal portion they increase in length and become spindle-shaped, circular in cross section, and tapering to a long threadlike portion. The larger filaments contain an axial canal, and reach a maximum length of 200 mm. and a diameter of 10 mm.

In life, the medusa has an exquisite color scheme of purple, violet, and rose pink. The gonads are, as a rule, pink, the general color is violet, and the fringe of tentaclelike marginal lappets purple. These colors vary considerably in intensity and arrangement. In formalian, the entire medusa is milky gray and the gonads and mouth fringes are yellow.

These medusæ with their numerous tentaclelike velar lappets, their exumbrellar papillæ, and their arm appendages—all of which are very long, slender, and flexible and all of which are colored some shade between rose pink and purple—present a most striking and beautiful appearance, and as they are found on or near the surface are most conspicuous objects.

Numbers of young fish of the genus *Caranx* were found living in the mass of filaments and mouth arms.

L. mayeri differs from *L. smithii* in that it has from 12 to 16 rhopalia instead of 8, in that the circular muscle is completely interrupted in the ocular radii, in that it has a false ostium in each interostial pillar, and in that the interocular canals do not reach the bell margin.

I have handled this medusa and have seen and experienced the results of the sting which are very similar to those of a nettle sting and are not at all serious. This is surprising in view of the statements of Dr. H. M. Smith as given by Mayer with regard to the closely related *L. smithii* Mayer.[9] It seems to me much more probable that the cases of poisoning reported by Old[10] were due, as I have said before, to the "*Chrysaora* stage" of *Dactylometra quinquecirrha* which is common in the harbor. The Filipinos state that the latter form is very poisonous, and a number of instances are known in which it has caused severe symptoms of poisoning.

I append a table of comparative measurements and the number of rhopalia and lappets to a paramere of the two specimens of *L. mayeri* in the collection.

Measurements of Lobonema mayeri sp. nov.

	Specimen A.	Specimen B.
Bell diameter millimeters	350	340
Arm disk, diameter do	125	110
Maximum length of the velar lappets do	180	200
Number of rhopalia	12	16
Number of velar lappets	[a] 3-6	[b] 3-4
Width of the subgenital ostia millimeters	[c] 75	[c] 70
Width of the interostial pillars do	32	33
Width of the pillar cavity (false ostium) do	25	22
Length of the mouth arms from the center of the arm disk do	180	180

[a] 6 in 4 parameres, 5 in 2, 4 in 5, and 3 in 1.

[b] 4 in 13 parameres and 3 in 3.

[c] More than twice the width of the pillar.

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[9] *Pub. Carnegie Inst. Wash.* (1910), No. 109, 3, 690.

[10] *This Journal, Sec. B* (1908), 3, 329.

Genus **LOBONEMOIDES** novum

Generic characters.—*Lobonema*-like *Rhizostomata triptera* in which the marginal lappets are pointed but not greatly extended. The mouth-arm membranes are not perforated by windowlike openings. There are more than 8 rhopalia, twice as many radial canals as sense organs all extending to the margin, and a ring canal. The ring canal gives off externally a network of anastomosing canals, extending to the margin, and internally a series of anastomosing canals on each side of each rhopalar canal, which do not reach the stomach and are connected with the rhopalar canals but not the interrhopalar canals. The exumbrellar sensory pits are furrowed with radiating dendritic grooves. Each mouth arm bears numerous small scattered appendages and one large terminal spindle-shaped appendage, all of which taper to filamentous outer ends.

The type species is *L. gracilis* sp. nov. from Taytay, Palawan.

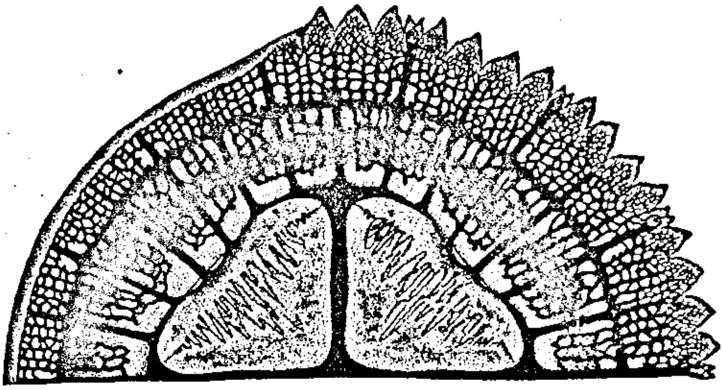

FIG. 10. *Lobonemoides gracilis*, an exumbrellar view of half the bell, showing the canal system, the marginal lappets, etc. × 1.

Lobonemoides gracilis sp. nov. (figs. 10, 11, 12, and 13).

Type.—No. C. 2422, zoölogical collection, University of the Philippines.

The bell is flat, 50 to 85 mm. in diameter, and very transparent. The stomach and canals are semiopaque white and the gonads opaque white. That part of the bell which lies outside the ring canal is very thin and flexible, while the central portion is rather thick and stiff. This outer thin region is about 17 mm. wide in the type specimen. The bell is 7 mm. thick outside the ring canal, 14 mm. high through the outer edge of the arm disk, and 10 mm. high through the center of the arm disk. There are a few scattered papillæ on the exumbrella, increasing in size toward the center. They are small, slender, and flexible, and reach a length of 2 mm. and a basal diameter of 0.5 mm. In preserved specimens they lie flat on the disk.

There are 14 rhopalia and twice as many radial canals, all extending to the margin. The sense organs are very short, thick clubs lying at right angles to the plane of the bell with the swollen end toward the exumbrellar surface. Between each pair of sense organs, there are 6 marginal lappets—4 large pointed triangular velar lappets between 2 small pointed ocular lappets. The rhopalar canals are somewhat larger than the interrhopalar canals, and divide distally to form a U-shaped sinus in the upper part of the ocular lappets. In the curve between the limbs of this sinus lies the sense organ. The exumbrellar sensory pit is dendritically grooved. The ring canal lies at the outer edge of the swollen central region of the bell, and its greatest breadth is at right angles to the plane of the umbrella. The radial canals curve over this swollen area to the ring canal, which gives off externally and internally a set of anastomosing canals. The external network is connected in a number of places with both the ocular and interocular canals, and it approaches the latter more closely and is joined to it in a greater number of places. Internally, a network of 3 or 4 anastomosing canals is given off by the ring canal on each side of each ocular canal to which it is joined in 2 or 3

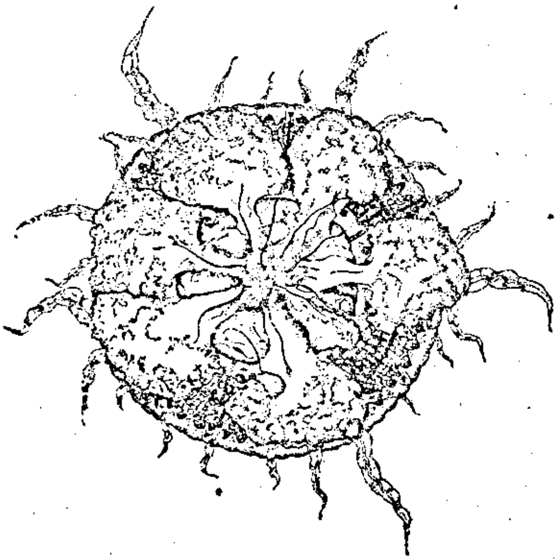

FIG. 11. *Lobonemoides gracilis* gen. et sp. nov., ventral view of the medusa. × ½. Two of the mouth arms of this specimen are aborted.

places. The interocular canals internal to the ring canal are broader than the ocular canals, and show a sinuslike broadening where they join the ring canal. Beyond the ring canal the interocular canals are small and are closely surrounded by the network of anastomosing canals, while the ocular canals maintain a uniform size to the margin and have on either side just outside the ring canal a small area free from the anastomosing canals.

The arm disk is 50 mm. in diameter, swollen in the zone of origin of the arms, and thin in the center of the disk. The subgenital ostia are 18 mm. in width and 4 mm. high, with a concave upper and swollen convex lower lip. The interostial pillars are 9 mm. wide. The subgenital porticus is unitary and square. Each gonad lies in a complex series of folds in the floor of the stomach. The folds are longest in the center and shortest at the ends, where at the level of the center of the interostial pillars the gonads are separated from one another by a very short space. Thus the outer edges of the gonads outline a square area, the corners of which coincide with the centers of the interostial pillars. The bases of the pillars are rounded, and the edge of the portion of the arm disk between them is straight, so the arm disk may be considered 8-sided—rounded and straight faces alternating with one another—or more exactly 4-sided, each corner being rounded. The outline of the stomach is square, but the invaginated gonads have so encroached on it as to leave only a narrow cruciform cavity whose outer ends are joined by a marginal sinus from which the radial canals originate.

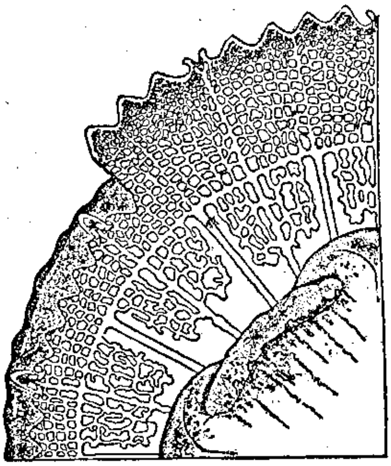

FIG. 12. *Lobonemoides gracilis*, a diagrammatic representation of a quadrant of the bell from the subumbrellar side, showing the subgenital ostium, canals, etc. × 1.

The arms are about equally spaced. The two arms on a common interostial pillar are widely separated, so that the base of each arm lies over the outer one-third of a gonad. The arm disk at the base is a little wider than the bell radius, while at the point of origin of the arms it is only five-ninths as wide as the bell radius. The arms are 50 mm. long from the center of the disk, and so a little longer than the bell radius. They are very flexible. The inner wings bear mouths to the center of the disk. The distal 3-winged portion of the arm is about one-half the total length of the arm. The branches are slender and delicate, and the fringed mouths are not crowded, except toward the tip of the arms. At the center of the disk is a slender filament, and around this a whorl of similar filaments, one in the axil between each pair of arms arising from a common interostial pillar. Scattered among the mouths are a few similar but smaller filaments. At the end of each mouth arm there is a large spindle-shaped appendage tapering to a filamentous distal end and having a central canal. Scattered on the distal ends of the arms are a few similar but smaller appendages. The terminal appendages reach a length of 45 mm. and a maximum diameter of 6 mm.

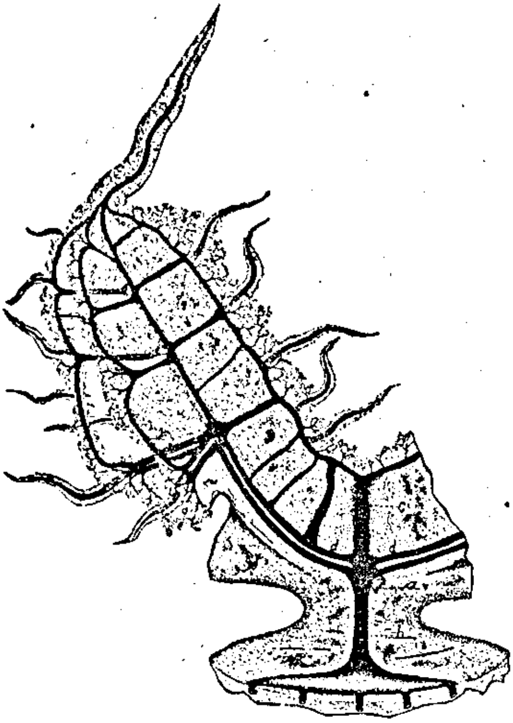

FIG. 13. *Lobonemoides gracilis*, lateral view of one mouth arm and an interostial pillar, showing the ducts as seen in an injected specimen; diagrammatic. × 1.

Each of the very narrow, interradial limbs of the stomach receives two ducts from the mouth arms, one (fig. 13, *a*,) at a point about one-third of the distance from its outer end to the center and the other (fig. 13, *b*) at the outer end. These two ducts originate from the point of junction of three main ducts in the mouth arms. The central one (fig. 13, *c*) is formed by the union of the ducts, which run along the outer edge of the inner wing of the two arms supported by a common pillar and give off smaller ducts to the branches of their inner wings. This union occurs not far from the disk center in the axil between two mouth arms supported on the same interradial pillar. The other two (fig. 13, *d*) are the main central ducts from the same two mouth arms. Each of those two main ducts divides at the point of origin of the two outer arm wings into 3 main branches, the two larger of which run to each of the outer arm wings and join the ducts running along the outer surfaces of these wings. These and the main ducts of the arms are often double (fig. 13). The smaller one runs through the center of the arm, giving off branches to the outer ducts of the 3 wings till at the tip of the arm it and the outer ducts of the 3 wings are joined. The main duct of each arm sends off in its proximal portion one large connecting branch and numerous smaller connecting branches to the outer duct of the inner mouth arm.

The medusa is transparent white, and the gonads are yellow.

There are 3 specimens of this new and interesting medusa collected by Dr. R. P. Cowles along the beach at Taytay, Palawan. Measurements of them are given in the following table.

Measurements of Lobonemoides gracilis sp. nov.

Specimen.	Bell diameter.	Arm-disk diameter.	Length of the mouth arms.	Width of the subgenital ostia.	Width of the interostial pillars.
	mm.	*mm.*	*mm.*	*mm.*	*mm.*
Type C. 2422	85	50	50	13	10
Cotype A	70	44	44	16	8
Cotype B	47	34	30	12	5

This is a very puzzling form to place systematically. It may possibly be a growth form of *Lobonema mayeri* or some other species of that genus, for in many ways it resembles these medusæ, but it lacks the two main generic characters of *Lobonema*, the tentaclelike marginal lappets and the perforated arm membranes. Further, it was collected on the east coast of Palawan, whereas *L. mayeri* was found only on the west coast. The gonads of *Lobonemoides gracilis* are well developed although not fully mature, and its sense organs and the arrangement of the canals of the mouth arms are different from those of *L. mayeri*.

For these reasons, I have decided to consider it as a mature form which necessitates the formation of the new genus to which I have given the name *Lobonemoides,* because of its resemblance in certain characters to Mayer's genus *Lobonema.*

The classification of a form such as this brings in question the purpose of systematic work. As I see it, the function of such work is to bring before scientific workers the forms of life in such a way as to make possible their differentiation and consequently to allow of their being placed in a general system and used as a basis for scientific inductions. The binomial system of nomenclature has been adopted as the most practical method of accomplishing this end. The placing of scientific data before the world is the essential part of such a work. The mere introducing into the literature of the group of a new generic or specific name is the smallest part and should be but a means to an end. It seems to me, therefore, that the possibility that these names may in the future become synonyms should not prevent the worker from accomplishing this purpose. For example, I might have described the above species as a doubtful, immature form of *L. mayeri.* But this denies a place in the classification and nomenclature of the group to a very interesting medusa form, which in so far as present data is concerned is a new species of a new genus and concerning which there may be no more data for years. It practically buries it from all but a very few workers; whereas, if it be given a generic and specific name it receives a place in the nomenclature of the group and is thus brought to the attention of all workers, and the question as to whether it is a mature form or not will, no doubt, be sooner settled and the medusa put in its proper place. If it be a growth form, the name which I give it will become a synonym and be discarded, but it will have accomplished the purpose for which it was given.

RHIZOSTOMATA LORIFERA Vanhöffen

Genus **RHOPILEMA** Haeckel, 1880

Rhopilema visayana sp. nov. (figs. 14, 15, and 16).

Type.—No. C. 2423, zoölogical collection, University of the Philippines. From Taytay Bay, Palawan.

The bell is from 200 to 400 mm. in diameter, and is hemispherical or more convex than a hemisphere. The central portion which forms the upper wall of the stomach is thick and stiff, while the remainder is very thin and flexible. The exumbrella is covered with numerous small, pointed, spinelike projections.

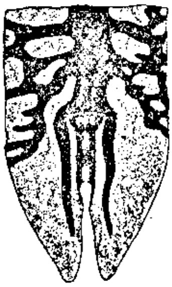

FIG. 14. *Rhopilema visayana* sp. nov., an exumbrellar view of a sense organ, showing the adjacent canals as seen in an injected specimen. Enlarged.

These are about 0.5 mm. in basal diameter and 0.75 mm. high. They are scattered over the surface, are about 2 mm. apart at the margin, and increase in number toward the apex, where they are only about 0.5 mm. apart. Scattered among these on the sides of the exumbrella are a few low, flatly rounded papillæ about 1.5 mm. in diameter and 0.5 mm. in height.

Each of the 8 rhopalia shows a distinct, brown, pigmented area. There are typically 8 thin, rounded, velar lappets in each octant. The free outer ends and the deep irregular grooves between them are free from the projections found on the rest of the exumbrella. The width of these lappets is variable, and their outer ends sometimes show bifurcation.

The canal system is very similar to that of *R. hispidum* Maas, the 16 radial canals extending to the margin. Each adradial canal shows a sinuslike swelling at the point of origin of its innermost and largest branch. The radial

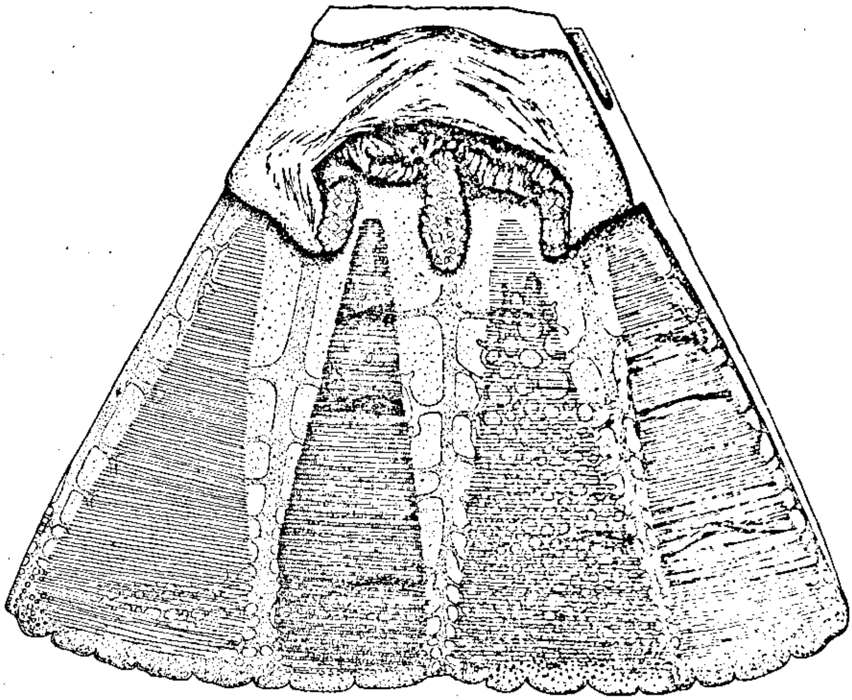

FIG. 15. *Rhopilema visayana*, subumbrellar view of a quadrant, showing the canal system, the radial muscles, and the subgenital ostium with the three papillæ. × ½.

canals divide the radial muscle into triangular areas which are widely separated proximally.

The genital ostia are as wide as the interostial pillars, and are partly closed by 1 large median papilla and 2 smaller, lateral, elongated, roughened, wartlike papillæ, each lying in the line of a radial canal. The partitions between the 4 genital cavities are narrow but complete.

The arm disk is supported by 4 broad, flat pillars. The distance from the base of one of these to the base of the one opposite it is 170 mm. The united arms arise from the center of the arm disk, and are only 60 mm. in diameter where they leave the disk. The mouth arms, measured from the outer surface of the arm disk, are 190 mm. in length. They are united proximally for more than two-thirds of this distance, the distal free portion measuring 75 mm. When the arms are spread out, the specimen is 200 mm. from the tip of one arm to the tip of the arm 180° from it, the central united portion being 50 mm. across at this point. The 3-winged portion of the arm makes up less than one-half of the free distal portion of the arm. Each of the two outer wings bears a dichotomously divided branch near its origin, and is divided distally into 4 flattened, tapering, nearly naked branches. Scattered among the mouths are appendages of three types: Long, flexible, somewhat flattened, filamentous append-

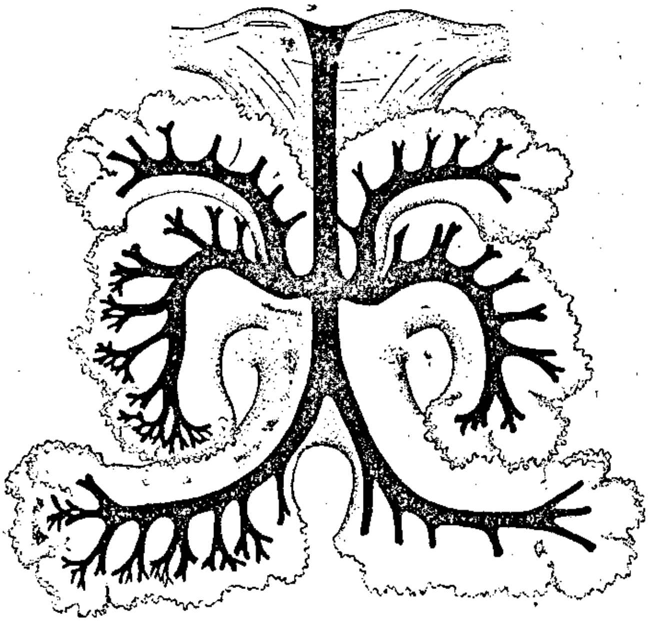

FIG. 16. *Rhopilema visayana*, a diagram of the arrangement of the ducts of two mouth arms supported by a common pillar and of their scapulets. × ½.

ages; shorter, flattened, ribbonlike appendages; and pointed, spindle-shaped or wedge-shaped appendages, the largest of which is usually terminal.

The scapulets are about 65 mm. long and 45 mm. wide at the base, their upper and outer surfaces bearing numerous mouths, among which are many long, filamentous appendages. The scapulets are branched along either side, and are deeply bifurcated at the outer end.

Each interostial pillar contains a main duct which enters the outer end of one of the 4 stomach lobes and is formed by the union of the main ducts of the 2 mouth arms arising from the same pillar. The main ducts of the 2 arms unite somewhat beyond the scapulets, and the main duct formed by their union receives on each side a duct formed by the union of the ducts of the two scapulets of that side. The main duct of each mouth arm receives a number of smaller ducts from the inner surface of the mouth arm and a very large duct from each of the 3 outer wings of the distal portion of the arm.

The color in both preserved and living specimens is opaque white.

This medusa was very common in Taytay Bay, Palawan, during May, 1913. Nearly every specimen examined contained one or more living individuals of a species of a crab, *Charibdis* (*Gonionemus*) *crucifera* (Fabr.) M. Edwards. These crabs were considerably paler than is typical for the species, which would seem to indicate a somewhat extensive residence within the medusa. I have also seen the medusa accompanied by large numbers of small fish apparently belonging to the genus *Caranx*. In some instances, these fish were seen to be eating the medusa, but in all such cases the medusa was dead. When the medusa was alive, they seemed to maintain a commensal relation. The fish would be seen playing about among the mouth arms and appendages and on being alarmed would disappear under the edge of the bell, between the arms or in the subgenital porticus. A similar condition was found in the case of *Lobonema mayeri*. I am told that *R. visayana* which is closely related to the common edible medusa of Japan, *R. esculenta* Kishinouye, is used for food by the inhabitants of the east coast of Leyte where it is preserved in vinegar. As it is apparently a common form in the Visayas (hence the name), there is no reason why it should not form a staple article of food.

It is very closely related to *R. hispidum* Maas, but differs from it in having a distinct pigmental area in the sense organ, in having its mouth arms united for more than two-thirds of their length, and in having 3 wartlike papillæ in the mouth of the subgenital ostia.

ILLUSTRATIONS

(Drawings by Santos, Fajardo, and Peñya)

TEXT FIGURES

FIG. 1. *Cassiopea polypoides* Keller var. *culionensis* var. nov., a sense organ from the subumbrellar side. Much enlarged.

2. *Cassiopea medusa* sp. nov., a sense organ and the adjacent canal system from the subumbrellar side. Very much enlarged.

3. *Cassiopea medusa*, a portion of a mouth arm, showing the scattered mouths and the very typical appendages. × 1.

4. *Acromitus maculosus* gen. et sp. nov., lateral view of the medusa. × 8/9.

5. *Acromitus maculosus*, an exumbrellar view of a sense organ; diagrammatic. Much enlarged.

6. *Acromitus maculosus*, an exumbrellar view of a portion of the bell, showing the canal system as seen when injected; somewhat diagrammatic.

7. *Lobonema mayeri* sp. nov., a quadrant of the exumbrellar surface, showing the papillæ, sense organs, and tentaclelike marginal lappets. × 1/2.

8. *Lobonema mayeri*, a mouth arm, showing the appendages, the windowlike openings, and the irregular arrangement of the ducts; somewhat diagrammatic. × 1/3.

9. *Lobonema mayeri*, a sense organ from the exumbrellar side. Much enlarged.

10. *Lobonemoides gracilis*, an exumbrellar view of half the bell, showing the canal system, the marginal lappets, etc. × 1.

11. *Lobonemoides gracilis* gen. et sp. nov., ventral view of the medusa. × 1/2. Two of the mouth arms of this specimen are aborted.

12. *Lobonemoides gracilis*, a diagrammatic representation of a quadrant of the bell from the subumbrellar side, showing the subgenital ostium, canals, etc. × 1.

13. *Lobonemoides gracilis*, lateral view of one mouth arm and an interostial pillar, showing the ducts as seen in an injected specimen; diagrammatic. × 1.

14. *Rhopilema visayana* sp. nov., an exumbrellar view of a sense organ, showing the adjacent canals as seen in an injected specimen. Enlarged.

15. *Rhopilema visayana*, subumbrellar view of a quadrant, showing the canal system, the radial muscles, and the subgenital ostium with the three papillæ. × 1/2.

16. *Rhopilema visayana*, a diagram of the arrangement of the ducts of two mouth arms supported by a common pillar and of their scapulets. × 1/2.

NOTES ON PHILIPPINE ALCYONARIA

PART II: LEMNALIOIDES KÜKENTHALI, A NEW GENUS AND SPECIES OF ALCYONARIA FROM THE PHILIPPINES AND A DISCUSSION OF THE SYSTEMATIC POSITION OF THE NEW GENUS

By S. F. LIGHT

(From the Zoölogical Laboratory, College of Liberal Arts, University of the Philippines)

One plate and 8 text figures

Genus **LEMNALIOIDES** novum

Generic characters.—The colony is upright, treelike, or bushy, and consists of a number of stems coalesced in one or more groups for some distance above the base. The tubular, nonretractile polyps are scattered singly or in little groups on the branches and lateral and terminal twigs. The spiculation of the cortex and the canal walls is similar to that in *Lemnalia.* The tentacles contain a very few, very small, scattered spicules, and the stomodæum contains no spicules. The tentacles bear more than one row of pinnules, and show a median longitudinal band of muscle fibers on their outer surfaces. The type of the genus is *Lemnalioides kükenthali* sp. nov.

Lemnalioides kükenthali sp. nov. (Plate I; text figs. 1 to 6).

Type.—This species is described from a single well-developed colony from one of the shallow reefs in Port Galera Bay, Mindoro, No. C. 254, zoölogical collection, University of the Philippines. Collected by S. F. Light in May, 1912.

The colony, which is 115 mm. in height and 110 mm. in greatest breadth across the polypary, arises from a small somewhat encrusting base, 38 mm. in length and 25 mm. in width. It consists of 2 main stalks or groups of stems which divide at a height of about 40 mm. to form a number of stems or main branches. These are divided and subdivided toward their outer ends to form a number of distally directed, closely approximated branches. On the slender, lateral and terminal twigs of these branches and scattered to some extent on the branches themselves are the large, tubular, nonretractile polyps. They arise singly or in little groups, and are all expanded in the type specimen (Plate I), where they average from 1 to 2 mm. in length and about 0.5 mm. in diameter. The lateral twigs decrease in length from as much as 9 mm. at the base of a branch to 3 or 4 mm. toward the tip of the branch. The lines of the canal walls are distinct on the stem and branches, and each polyp can be plainly seen to be the termination of a canal.

The stomodæum is long, thick walled, and spindle-shaped, and contains no spicules. In an average polyp it is 0.6 mm. in length and 0.2 mm. in greatest (central) diameter. The tentacles are large with a double row of short thick pinnulæ on each side and a median band of muscle fibers on the outer surface (fig. 6). They contain only a very few, small, scattered spicules.

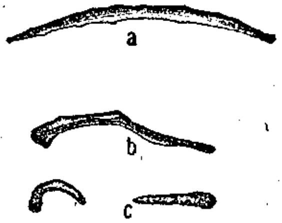

FIG. 1. Spicules from the polyp and tentacles of *Lemnalioides kükenthali; a,* a polyp spindle showing the axis to be seen in cleared specimens; *b,* a spindle from the distal end of one of the double rows, showing the axis and the divided and sculptured distal end; *c,* tentacle spicules. × 112.5.

The polyp armature is not heavy, and consists of smooth spindles in an irregularly transverse arrangement on the body of the polyps. Distally, they form a double row of 5 or 6 pairs of spindles at the base of each tentacle (fig. 6).

The polyp spindles are rather irregular, bent, or curved, with a few low projections, and a narrow, distinct, central axis, and appear, in cleared specimens, to be more like flexible fibers than stiff spicules (fig. 1, *a*). They are from 0.15 to 0.20 mm. in length and from 0.005 to 0.008 mm. in diameter, and have somewhat swollen and divided ends. This is particularly true of the distal ends of the spindles of the double rows which are mushroomed and much divided and sculptured (fig. 1, *b*).

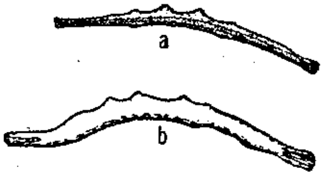

FIG. 2. Spindles from the stem cortex of *Lemnalioides kükenthali; a,* from the upper stem; *b,* from the mid stem. × 112.5.

The very few tentacle spicules are irregular forms found in the crotch between two tentacles and here and there in the pinnules of the lower part of the tentacles. They range from 0.04 to 0.05 mm. in length, and are sculptured over their entire surface, particularly heavily at the outer ends (fig. 1, *c*).

The spicules of the stem and branch cortex are spindles. They are numerous, but do not seem to have the hard brittle character of the spicules of *Lemnalia,* as the cortex of the colony except at the base is soft and pliable. In the upper stem, these spindles are smooth and curved and are very similar to those of the polyp but with a wider, more conspicuous axis and with slightly enlarged, divided, and roughened ends (fig. 2, *a*). Among them are a few heavier spindles, whose axes are not distinct and which show a few projections on the convex surface (fig. 2, *b*). Proximally, the spicules of the latter type increase in number and become rougher and more irregular. Some of these spindles have numerous blunt projections in zones, others have projections on the convex surface, some of them graduate into 4-rayed forms and forms approaching the double stars or capstanlike forms of so many species of *Lemnalia* (fig. 3). In the extreme base, these double stars and capstanlike forms predominate (fig. 5).

The spindles of the branch cortex reach a length of 0.15 mm. and a diameter of 0.01 mm.; those of the cortex of the upper stem are from 0.17 to 0.29 mm. in length and from 0.008 to 0.015 mm. in diameter; those of the cortex of the middle of the stem are from 0.18 to 0.3 mm. in length and from 0.009 to 0.02 mm. in diameter. The curved spindles of the cortex of the lower stem are from 0.05 to 0.19 mm. in length and from 0.019 to 0.036 mm. in diameter, and the club-shaped forms are from 0.08 to 0.12 mm. in length, from 0.04 to 0.05 mm. in greatest diameter, and about 0.025 mm. in least diameter. The spicules of the base are from 0.057 to 0.08 mm. in length, from 0.04 to 0.07 mm. in maximum diameter, and about 0.02 mm. in least diameter.

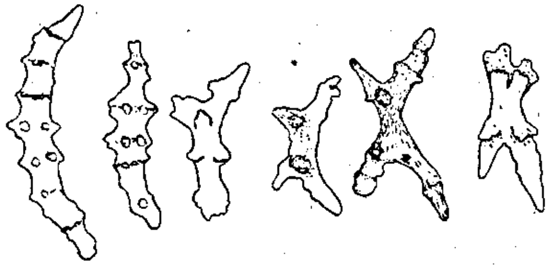

FIG. 3. Spicules from the cortex of the lower part of the stem of *Lemnalioides kükenthali*. × 112.5.

The spicules of the canal walls are similar in form throughout the whole colony, being smooth, rodlike bodies with roughened, expanded, and divided ends (fig. 4). These increase from an average length of 0.25 mm. and a diameter of 0.009 mm. in the branches to a length of 0.5 mm. and a diameter of 0.026 mm. in the base.

The cortex of the entire colony contains large numbers of unicellular algæ. These are particularly numerous toward the base, and give the cortex a characteristic appearance in cleared specimens when examined under the microscope.

The stem is yellowish brown and the polyp-bearing portion is light brown in formalin.

I have named the type species of the genus in honor of Prof. Dr. Willy Kükenthal, whose epoch-making work in bringing order out of chaos in the classification of the *Alcyonaria* is too well known to need recounting here.

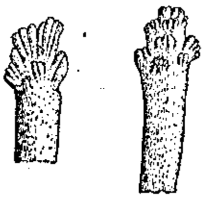

FIG. 4. The ends of two spicules from the canal walls of *Lemnalioides kükenthali*, near the base of the colony. × 230.

I was pleased to see in a recent reprint (1913), which the author kindly sent me, that Kükenthal has come to the conclusion that the first four species, included in his revision of the Nephthyidæ (1903), in group A of the key to the species of the genus *Lithophytum* as well as *L. elegans*, *brassica*, and *armatum* belong to the genus *Lemnalia* and to a new genus *Paralemnalia* rather than to *Lithophytum*. As the classification stood before, *Lemnalia* and *Lithophytum* overlapped and neither was clearly defined. I had been forced to this conclusion by a study of the large collection of Nephthyidæ in the museum of the University of the Philippines. It was first and most strikingly brought to my attention when separating the species into generic groups. Following Kükenthal's key to the genera of the Nephthyidæ (1903), a distinct group of species was found which seemingly belonged to *Lemnalia*, and a study of the literature of that genus confirmed me in that opinion. On studying the key to the species of *Lithophytum*, however, I found the same group of species to agree very closely with certain of the species of group A of that genus. A further study of the descriptions of the species in group A convinced me that some of them were of the same genus if not of the same species as the specimens in our collection, which after a careful study of the works of Gray (1866), Bourne (1900), and Kükenthal (1903) I concluded were, without the possibility of mistake, species of the genus *Lemnalia* Gray emend. Bourne emend. Kükenthal. By placing the five species *africana* May, *elegans* May, *flava* May, *brassica* May, and *armatum* Kükth. in the genus *Lemnalia*, Kükenthal has put it and the genus *Lithophytum* on a clearer and more workable basis as he has clearly shown in his Alcyonarien des Rothen Meeres.

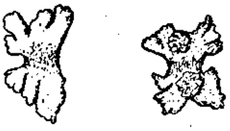

FIG. 5. Two spicules from the cortex of the extreme base of *Lemnalioides kükenthali*. × 112.5.

In this paper, Kükenthal also describes the new genus *Paralemnalia* to receive the species *thrysoides* Ehrbg. and *flabellum*

Q. and G. (including *Ammothea digitatum* May), both previously placed by him in the genus *Lithophytum,* and a new species *P. eburnea,* thereby further clearing up the situation in the genus *Lithophytum.* He diagnoses the new genus *Paralemnalia* as follows:

> Die von einer gemeinsamen Basis entspringenden glatten sehr rigiden und zerbrechlichen Hauptstämme sind nicht weiter verzweigt, höchstens können sie sich gabeln. Die Polypen sitzen direkt an diesen Hauptstämmen, und zwar stets einzeln, niemals in "Bündel," "Büschel" oder "Kätzchen" vereint, die Polypen sind retraktil, und ihr unterster Teil kann mehr oder wenig deutlich zu einem Kelch umgebildet sein. Die Kanalwände sind dünn, aber dicht erfüllt mit einem Netzwerk spindelförmiger Spicula. In ihrer Gestalt schliessen sich die Spicula der verschiedenen Regionen an die von *Lemnalia* an. Verbreitung; Indopazifischer Ozean, in flachem Wasser.

This new genus has for its type species *Ammothea thrysoides* Ehrbg. which Gray (1868) placed together with *Ammothea* (*Alcyonium*) *ramosa* (Q. and G.) in his new genus *Verrilliana.* His diagnosis of this, as of so many other genera, *Lemnalia* for example, was not only incomplete but incorrect, and was ignored by subsequent workers. In the case of *Lemnalia,* although the description was incorrect, the species described, including the type species (that is, the first one named, as no type was designated), did belong to a distinct genus, and Bourne when he revised the genus retained Gray's name, *Lemnalia.* In the case of *Verrilliana,* however, of the two species named as belonging to the genus, *Ammothea ramosa* was given first and is, therefore, since no type was named, the type species of the genus. This form, however, is undoubtedly a species of the older genus *Ammothea* (now *Lithophytum*), and thus the name *Verrilliana,* the type species having been removed or rather returned to another genus, becomes a homonym. This, together with the very poor diagnosis, would seem to afford ample reason for dropping the name *Verrilliana.*

Kükenthal speaking of this point says:

> Est ist mir daher ganz unmöglich, den namen *Verrilliana* für die von mir aufgestellte Gattung wieder zu verwenden, um so mehr als Gray ausser der *A. thyrsoides* auch noch das *Lithophytum arboreum* (Q. and G.) zu seiner neuen Gattung rechnete.
>
> Beide Arten haben aber nicht das geringste miteinander zu tun, * * *.

He evidently refers here to *Alcyonium ramosa* of Quoy and Gaimard, which Gray gave as the first species of his genus *Verrilliana,* as I find no references to *Lithophytum arboreum* (Q. and G.), and *Lithophytum arboreum,* the type species of the genus *Lithophytum,* was named by Forskål. In either case, Kükenthal is eminently correct in finding no resemblance between such forms as *Paralemnalia thyrsoides* and such characteristic Lithophyta as *L. ramosa* and *L. arboreum.*

Our collection contains a number of specimens of the type species of this genus, *Paralemnalia thrysoides* (Ehrbg.) Kükenthal. They are from three rather widely separated regions: Bantayan Islands; Sabong (near Port Galera Bay), Mindoro; and Batas Island on the east coast of Palawan. I found it especially abundant on the reefs of the Sulu Sea side of Palawan, where it was one of the common reef Alcyonaria. The spreading colonies with their stiff upright stems reach a diameter of more than a meter, and are usually found associated with Alcyonidæ to which they have a superficial resemblance. It is one of the most beautiful of the Philippine reef Alcyonaria. The expanded colony has in life a soft velvety appearance, owing to the long flexible polyps which reach a length of from 10 to 15 millimeters.

An examination of the stomodæal walls of these specimens has demonstrated the presence of numerous spicules (fig. 8) somewhat similar to those found in the stomodæal walls of *Lemnalia* (fig. 7).

Judging from May's description and drawings (1899) and from a study of a large collection of *Lemnalia* in our museum, I suspect that *Ammothea digitatum* May which Kükenthal has included with *L. flabellum* as *Paralemnalia flabellum* is a species of *Lemnalia* rather than of *Paralemnalia* or at least an intergrading form. A reference to May's figures (1899) of *Ammothea digitata* will show that the stems are branched. The diagnosis is further based on the retractility of the polyps and their arrangement singly on the stems. These characters must be used with caution as it is very difficult to differentiate between extreme contractility and retractility of polyps. A number of species of *Lemnalia* in our collection have polyps which are scattered singly on the stems and twigs and which are so strongly contractile as scarcely to show above the surface and yet they are unmistakably species of *Lemnalia.*

Paralemnalia, however, as may be easily seen by a comparison of the type species, *P. thrysoides,* with any species of *Lemnalia,* is a distinct genus related to *Lemnalia* and *Lemnalioides.* It forms with these two a series of closely related genera of which *Lemnalioides* is most nearly related and *Paralemnalia* least nearly related to the genus *Lithophytum.* The method of branching, the form of the colony, the arrangement of the polyps, and the proportion between the barren and polyp-bearing portions of the colony are similar in *Lemnalia* and *Lemnalioides,* but different from that in *Paralemnalia.* *Lemnalia* and *Paralemnalia,* on the other hand, have the characteristic stomodæum spicules which are not found in *Lemnalioides*. The tentacle spicules also, which are numerous in *Paralemnalia* and *Lemnalia*, are very few and scattered in *Lemnalioides*, and may very probably be found to be entirely absent in species as yet undiscovered.

In 1896 Kükenthal described and figured *Ammothea carnosa*, a new species from Ternate. In his revision of the *Nephthyidæ* (1903), he includes this species in group A of his key to the species of the genus *Lithophytum*, where its characters would naturally place it as the group was at that time defined. Since that time, two of the five species in this group, *L. flavum* and *L. africanum*, have been removed (Kükenthal, 1913) to the genus *Lemnalia* and two others, *L. thrysoides* and *L. flabellum*, to Kükenthal's new genus *Paralemnalia*. This leaves *L. carnosum* as the only member of group A remaining in the genus *Lithophytum*, and this in spite of the fact that Kükenthal says (1903):

> Vorliegende Art bildet zusammen mit *L. africanum, flavum* und *digitatum* eine natürliche Gruppe innerhalb der Gattung *Lithophytum*.

The excellent figures and description of *A. carnosa* show it to have characteristics which suggest a relationship to *Lemnalia*, *Paralemnalia*, and *Lemnalioides*. The small polyp-bearing area restricted to the anterior portion of the colony; the colony consisting of a number of stems united for a part of their length; and the typical form and size of the spicules, their arrangement on the polyps, and their presence (supposedly in considerable numbers) in the canal walls are all characters which suggest relationship to these genera. The absence of stomodæum spicules and the absence (or apparent absence) of tentacle spicules prevent *A. carnosa* from being included in the genus *Lemnalia*, and this character together with the branching colony exclude it from the genus *Paralemnalia*. But the presence of very few tentacle spicules and, possibly, as only one form has been examined, their entire absence is characteristic of the genus *Lemnalioides*. The form of its cortex and canal-wall spicules, and also their size and arrangement, are strikingly suggestive of *Lemnalioides kükenthali*. It seems probable then that a re-examination of the type in the light of the recent changes in the genus *Lithophytum* would show *Lithophytum carnosum* (Kükth.) to belong to the genus *Lemnalioides* proposed in this paper or to be a form connecting that genus with *Lithophytum*.

While in many ways the genus *Lemnalioides*, as the name indicates, approaches the genus *Lemnalia* to which it is undoubtedly closely related as I have shown above, the differences seem to me to be of generic value. In my study of a large collection of *Lemnalia* in which *Lemnalioides kükenthali* was at first included, I found that the differences between it and any species of *Lemnalia* in the collection were so much greater than the differences between the most widely different species of *Lemnalia* that it seemed impossible to place it with them in that genus. With the addition of the five species transferred from *Lithophytum* and the new Philippine species, the genus *Lemnalia* will contain some 20 or more species. As further collections in the Philippines and elsewhere will undoubtedly add to this number and as these species are closely related and very difficult to differentiate from descriptions without specimens for comparison, the separation from the genus of any natural group seems to be amply justified.

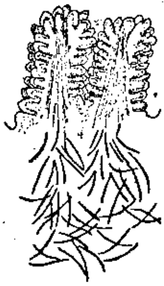

FIG. 6. Two tentacles from a cleared specimen of *Lemnalioides kükenthali*, showing the median muscle bands, the double rows of pinnules, and the double rows of polyp spicules. × 48.5.

The Philippine species of *Lemnalia* all show on dissection more or less numerous, characteristic spicules in the walls of the stomodæum (fig. 7). I have found no references to such spicules in any species of *Nephthyidæ* except *Gersemnia studer* (Koch). Gray (1866), Bourne (1900), and Kükenthal (1903 and 1913) evidently overlooked these spicules, and I have no doubt that a reexamination of the type specimens would show them to be present in all the known species of *Lemnalia*. This oversight is not to be wondered at as these spicules are very seldom to be seen unless the stomodæum is dissected away from the rest of the polyp and would not be discovered except by accident or by a more thorough morphological investigation than is usually undertaken in purely systematic work. They would probably escape detection in a histological investigation, also, such as that made by Bourne (1900) as the material must be decalcified before sectioning. I found dissection under the binocular microscope of specimens cleared in clove oil to be the best method of separating the stomodæum and studying the spicules of its walls. I have examined the stomodæal walls of several of the species of *Lithophytum, Nephthya, Dendronephthya, Stereonephthya, Capnella,* and *Siphonogorgia* in our collection, but find the stomodæum to be without spicules of any kind. In *Paralemnalia thrysoides*, however, as I have mentioned above, I found stomodæal spicules to be abundant.

In all the Philippine species of *Lemnalia*, there is a single row of pinnules on each side of the tentacle. Bourne (1900) notes the same condition in *L. nitida* (Verrill), and judging from the figures of Bourne (1900), May (1899), and Kükenthal (1903) the same is probably true of all the previously described species.

All the species of *Lemnalia* described by Bourne, Kükenthal's *L. umbellata,* and the Philippine species have numerous tentacle spicules. There are no tentacle spicules mentioned in the descriptions of May's species, but I have no doubt that, as in the case of the stomodæal spicules, a reëxamination of the type would show them to be present.

Kükenthal (1913) has emended his earlier diagnosis of *Lemnalia* (1903) to read:

> Von einer gemeinsamen, oft stark verbreiterten Basis erheben sich ein oder mehrere äusserlich glatte, wenig biegsame Hauptstämme, die sich an ihrem oberen Ende in verschiedener Weise verzweigen und an ihren Endzweigen in Bündeln oder Büscheln aber niemals in "Kätzchen" angeordnete Polypen tragen. Die Polypen sind nicht retraktil. Die Kanalwände sind dünn, aber dicht erfüllt mit einem Netzwerk spindelförmiger Spicula. An der Polypenwand finden sich neben grösseren, schlanken, bedornten Spindeln kleinere vor, bei denen die Dornen in ein Paar Kränzen angeordnet sind. Die Tentakel enthalten plattenförmige, fein skulpturierte Spicula. In der Rinde der Äste liegt ein dichtes Netz schlanker, meist gekrümmter Spindeln, die nach der Basis zu mit kleineren, mehr sternförmigen Spicula untermischt werden. Verbreitung; Indopazifischer Ozean, in flachem Wasser, auf Korallenriffen.

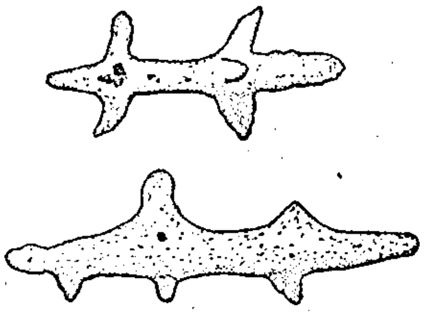

FIG. 7. Two spicules from the stomodæal walls of an undescribed species of *Lemnalia.* × 1,000. Actual lengths, 0.038 and 0.0532 mm., respectively.

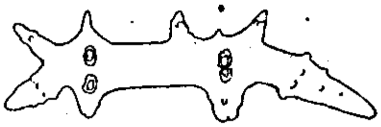

FIG. 8. A spicule from the stomodæal walls of *Paralemnalia thrysoides* (Ehrbg.) Kükenthal. × 1,000. Actual length 0.0513 mm.

I have found no small spicules in the polyp walls having two zones of projections as spoken of in the above diagnosis ("schlanken, bedornten Spindeln kleinere vor, bei denen die Dornen in ein Paar Kränzen angeordnet sind.") I have found such spicules, however, in the stomodæal walls of all the specimens I have studied, and I have also found them in very small numbers in the oral surface of a few species, and they are present in large numbers in the tentacles of two species. It seems very probable that the spicules here referred to are the stomodæal spicules which may sometimes be made out through the polyp walls of cleared specimens.

I propose still further to emend the diagnosis of the genus *Lemnalia* to read as follows:

Genus **LEMNALIA** Gray emended

Generic characters.—The colony is upright, stiff, or rigid, and consists of one or more stems arising from a common often broadened base. The stems may or may not be coalesced proximally in one or more groups for a portion of their length. They divide distally to form numerous branches and twigs. The polyps are not retractile, but may be so strongly contracted as to appear retractile. They are scattered singly, or in little groups, on the branches and lateral and terminal twigs. The tentacles bear on each side a single row of pinnules. The thin canal walls contain a close network of spindle-shaped or rod-shaped spicules whose ends are usually roughened, enlarged, and divided. The spicules of the polyp wall are spindles usually forming 8, more or less, distinct converging double rows in the bases of the tentacles; those of the branch cortex are spindles forming an interlacing felt work over the surface; those of the stem form a thick layer of spindles, club-shaped forms, 4-rayed forms, and double stars, the last predominating toward the base. The tentacles contain numerous spicules which may be of three types, curved or rod-shaped forms, finely sculptured flattened sclerites, or slender, irregularly branched, rod-shaped spicules. The walls of the stomodæum contain small, sculptured or unsculptured, rod-shaped or flattened, irregularly branched spicules, usually having two zones of projection and often showing bifurcation of one or both ends.

Lemnalioides it will be seen differs from *Lemnalia* as thus diagnosed, in that the tentacles contain very few spicules, in that the stomodæum contains no spicules, and in that there is a double row of pinnules along each side of the tentacles. Two other characters which may prove to be specific rather than generic in value are the presence in the mid line of the outer surface of each tentacle of a longitudinal band of muscle fibers and the presence in the ectoderm of *Lemnalioides* of little batteries of nematocysts which I have as yet been unable to find in any species of *Lemnalia*.

Lemnalioides differs from *Paralemnalia* most distinctly in its softer consistency, in its more treelike colony form, in that the polyps are sometimes arranged in little groups and are borne on the branches and twigs, in the absence of stomodæal spicules, and in the scarcity of spicules in the tentacles.

Because of these differences, I consider *Lemnalioides* a natural genus between *Lemnalia* and *Lithophytum*. It approaches *Lithophytum* in that the tentacle spicules are few and scattered and in the absence of stomodæal spicules. It further approaches it in its softer consistency and more treelike colony form. It is much more closely related to *Lemnalia*, however, which it resembles in its colony formed of proximally coalesced stems, in that the polyp-bearing portion of the colony is confined to a small distal portion of the colony, in its mode of branching, and very strikingly in the spiculation of the canal walls and cortex.

A further characteristic of *Lemnalioides* which separates it together with *Lemnalia* and *Paralemnalia* from *Lithophytum* as from all other nephthyid genera is the presence of very numerous long, sticky, elastic mesenterial filaments, extending to the base of the colony. This would seem to be a character which, together with the very characteristic form, size, and arrangement of the spicules of the canal walls and cortex and the presence of distinct polyp-bearing and barren portions of the stem with the preponderance of the barren portion, might justify the separation of the three genera *Paralemnalia*, *Lemnalia*, and *Lemnalioides* as a subfamily, Lemnaliinæ, within the family Nephthyidæ.

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ILLUSTRATIONS

PLATE I. *Lemnalioides kükenthali* gen. et sp. nov. The colony, natural size. (Photograph by Cortes)

TEXT FIGURES

(From camera lucida outlines)

FIG. 1. Spicules from the polyp and tentacles of *L. kükenthali; a*, a polyp spindle showing the axis to be seen in cleared specimens; *b*, a spindle from the distal end of one of the double rows, showing the axis and the divided and sculptured distal end; *c*, tentacle spicules. ×112.5.

2. Spindles from the stem cortex of *L. kükenthali; a*, from the upper stem; *b*, from the mid stem. ×112.5.

3. Spicules from the cortex of the lower part of the stem of *L. kükenthali*. ×112.5.

4. The ends of two spicules from the canal walls of *L. kükenthali*, near the base of the colony. ×230.

5. Two spicules from the cortex of the extreme base of *L. kükenthali*. ×112.5.

6. Two tentacles from a cleared specimen of *L. kükenthali*, showing the median muscle bands, the double rows of pinnules, and the double rows of polyp spicules. ×48.5.

7. Two spicules from the stomodæal walls of an undescribed species of *Lemnalia*. ×1,000. Actual lengths, 0.038 and 0.0532 mm., respectively.

8. A spicule from the stomodæal walls of *Paralemnalia thrysoides* (Ehrbg.) Kükenthal. ×1,000. Actual length, 0.0513 mm.

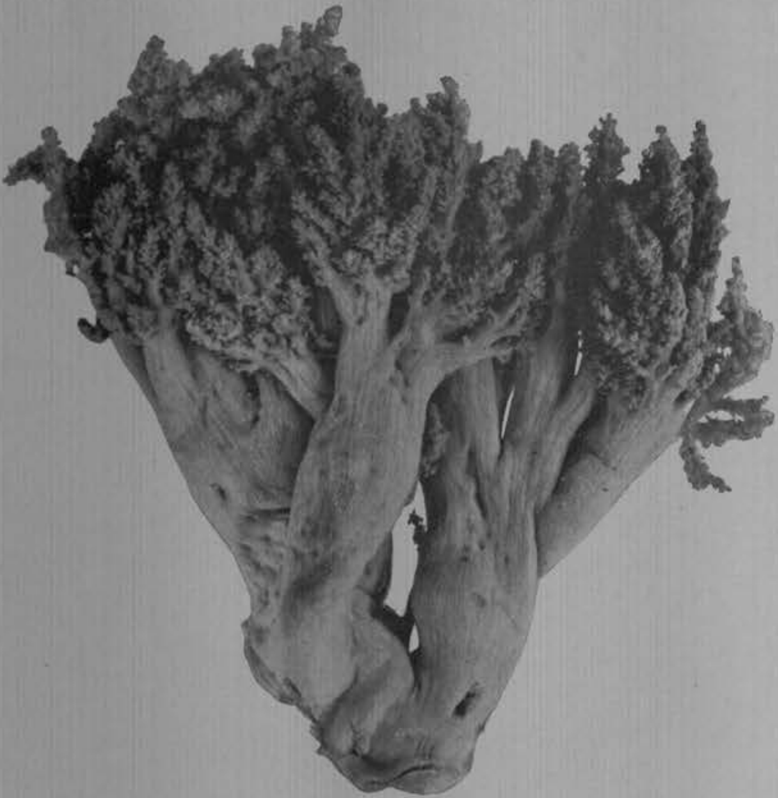

PLATE I. LEMNALIOIDES KÜKENTHALI GEN. ET SP. NOV. THE COLONY, NATURAL SIZE.

NOTES ON JAPANESE LEPIDOPTERA AND THEIR LARVÆ: PART I

By A. E. WILEMAN

(*Manila, P. I.*)

Three colored plates

RHOPALOCERA

While residing in Japan, I took a keen interest in the varied and curious forms of lepidopterous larvæ met with, an interest further stimulated by the perusal of works such as those of Owen Wilson and of Buckler.

With the exception of Nawa, Nagano, Matsumura, Miyake, and Sasaki, who have published articles in the Insect World (Konchū Sekai) and in other periodicals, few Japanese authors have devoted much attention to describing and figuring the larvæ of Japanese Lepidoptera which are comparatively unknown to science, and I felt that a wide and almost inexhaustible field of labor existed in this particular branch of entomological research. Therefore, I decided to figure the most interesting larvæ met with in my collecting rambles which have extended to many parts of Japan. As I was unable to make drawings of these specimens, I engaged the services of a Japanese artist, Hisashi Kaidō, in order that they might be accurately represented. In the course of two years, 1901 and 1902, while residing at Kobe and Hakodate, I accumulated 200 colored drawings, some of which will be used to illustrate this series of articles.

Hisashi Kaidō, at the time that I engaged him, had no experience in figuring larvæ, but I think the general results he has attained are very satisfactory.

Apart from the pleasure which the enthusiastic lepidopterist feels in being able to identify any curious larva he may meet by referring to the plates of special works and to descriptions and figures of the various stages of butterflies and moths, he may render much valuable assistance to the specialist in classifying species, and for this reason all individual efforts are welcome in a field where the harvest is great but the laborers are few.

For the scientific classification of Rhopalocera and Heterocera not only a knowledge of structure, such as wing venation and the genitalia, is necessary, but also a knowledge of the ova, larva, and pupa is required; and this is gained by tracing the life history of a species. In this respect I regret to say that my paper is incomplete as I have been unable to work out the life history of each species recorded. My aim has been merely to figure as many species of larvæ as I could collect and to accompany these figures with brief descriptions which have been taken from the original drawings by Hisashi Kaidō—not from the living pupa and larva. In describing larvæ, I have taken the head as the first segment.

As this paper is written with the thought of its aiding Japanese and other lepidopterists who may be working upon Japanese species, I have made a special point of quoting in the synonymy references to the works of Japanese authors. In some cases, the larvæ figured by me have also been previously figured either in colors, or in black and white, by Nawa and Nagano at Gifu.[1]

A most interesting characteristic of many lepidopterous larvæ, especially among the Heterocera, is their adaptability for harmonizing in color with their environment so closely that it is difficult to detect them. This is termed protective resemblance and may be special or general. Poulton,[2] has written at great length on this subject, and gives a table by which the colors of animals are classified according to their uses. As I shall have occasion to refer to this table when commenting upon the protective resemblance of certain larvæ figured, more especially with reference to species of Heterocera, I reproduce the data here as Table I with the consent of the publishers.

In order to obviate confusion I will say that Tokio, or Tokyo, the capital of the Japanese Empire, which in Japanese is called Dai Nihon Teikoku, is situated on an island equally well-known by any one of the three names of Hondo, Honto, or Honshu. Dai Nihon Teikoku is translated as the Japanese Empire or Great Japanese Empire, in the same way as the British Isles are known as Great Britain.

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[1] *Insect World* (*Konchū Sekai*) (1897–1913), 1–16. Other Japanese authors to whom I have referred in the course of this paper are the following:

Matsumura, Catalogus Insectorum Japonicum (*sic.*) (1905), 1 (no plates); and Nihon Senchū Dzukai (Thousand Insects of Japan) (1907), 4; (1909), supplement 1; (1910), supplement 2; (1911), supplement 3; all of these deal with Japanese Lepidoptera in the Japanese language, accompanied by many uncolored plates.

Miyajima, Nihon Chōrui Dzusetsu (Japanese Butterflies) (1904), with many colored plates.

Various details occurring in these works concerning the larvæ of the species figured by me and their food plants, the times of appearance, and geographical distribution of the imago have been incorporated in my notes.

[2] The Colours of Animals. 2d ed. London, Kegan Paul, Trench, Trübner & Co. Ltd. (1890), i–xiii+1–360.

Matsumura[3] calls the island on which the capital is situated Honto, and later[4] he calls it Honshu. For the sake of uniformity, I have adopted the name he uses in his latest work. Yezo he calls Hokkaido, as the name Yezo is but little used by modern Japanese. There will be no confusion with regard to the two large islands of Kyushu and Shikoku which are only known by these names.

The following are the names, given in their geographical order, of the chain of most important islands under Japanese rule, extending from Saghalien to Formosa.

Karafu-tō (Saghalien), southern portion only Japanese.
Chishima-tō (Kurile Islands).
Hokkaido (Yezo).
Hondo, Honto, or Honshu, on which the capital, Tokyo, and the ports of Yokohama and Kobe are situated.
Shikoku.
Kyushu (Kiushiu).
Tanegashima.
Yakushima.
Shichi-tō (Linschoten Islands or Cecilia Archipelago).
Ryukyu-tō (Loochoo Islands), consisting of the Hokubu-tō (northern group), Chubu-tō (central group), and Nambu-tō (southern group). The two latter groups are also known, respectively, as the Sannan and Miyako Islands.
Ogasawara-jima (Bonin Islands), to the east of Formosa.
Taiwan (Formosa).

The Japanese names of the food plants of larvæ described in this series of articles were mostly derived from my Japanese collector, Uehara Magoichi, who is now dead. He collected many of the larvæ for me, and although not a trained botanist he had a good working knowledge of Japanese flowering plants acquired during an experience of many years as a collector of Lepidoptera. I referred for the Latin names of these food plants to a book by Matsumura.[5] In cases of doubt, I have occasionally queried the Japanese or Latin name of the food plant.

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[3] Catalogus Insectorum Japonicum (*sic.*) (1905).

[4] Thousand Insects of Japan (Nihon Senchū Dzukai) (1907–1911).

[5] Shokubutsu Mei-i. Enumeration of selected Scientific names of both Native and Foreign Plants with Romanized Japanese names and in many cases Chinese Characters (1906).

RHOPALOCERA

PAPILIONIDÆ

Genus PAPILIO Doubleday

Papilio DOUBLEDAY, Gen. Diurn. Lep. (1846), 1, 5.

Papilio xuthus Linnæus.

Pl. I, figs. 1–2, young larvæ; fig. 3, full-grown larva; fig. 4, food plant.

Japanese name, *ageha*.

Papilio xuthus LINN., Syst. Nat. (1767), 1, 2, 751; PRYER, Rhop. Nihon. (1886), 2, Pl. 1, fig. 2 b, ♂; Tokyo Zool. Mag. [Tokyo Dōbutsugaku Zasshi (Jap.)] (May 15, 1891), 3, No. 31, Pl. 2, fig. 1, imago, *xuthulus;* fig. 2, imago, *xuthus;* fig. 3, larva 4th stage; fig. 4, larva 5th stage; fig. 5, pupa; NAWA, Insect World [Konchū Sekai (Jap.)] (1898), 2, 6, Pl. I, transf.; LEECH, Butterfl. China, Japan, Corea (1892–1894), 2, 514; MATSUMURA, Jap. Injurious Insects [Nihon Gaichūhen (Jap.)] (1899), 108, Pl. 46, fig. 1, imago; fig. 2, larva; MIYAJIMA, Jap. Butterf. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 72, Pl. I, fig. 1, ♂; DYAR, Proc. U. S. Nat. Mus. (1905), 28, 939, fig. 4, larva; MATSUMURA, Cat. Insect Jap. (1905), 1, No. 1, 1; MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)] (1907), 4, 62, Pl. 63, fig. 1, ♀; Seitz's Macrolep. of the World, Faun. Pal. (1906), 1, 11, Pl. 6a; JORDAN, Seitz's Macrolep. of the World, Faun. Indo-austral. (1909), 9, 48.

Papilio xuthulus BREM., Bull. Acad. Petr. (1861), 3, 463 (spring form); BREM., Lep. Ost.-Sib. (1864), 4, Pl. I, fig. 2; PRYER, Rhop. Nihon (1886), Pl. I, fig. 2a; Seitz's Macrolep. of the World, Faun. Pal. (1906), 1, 11, Pl. 6a.

Papilio xanthus LINN., Rothsch. Nov. Zool. (1895), 2, 278; MOORE, Lep. Ind. (1903), 6, 45. (=*P. xuthus* Linn.)

The full-grown larva figured (Plate I, fig. 3) was taken in September, 1900, at Kobe, Settsu Province, on *karatachi* (*Ægle sepiaria* DC.). No record was kept of the date upon which the imago emerged from the pupa resulting from this larva, but I have bred the species on many occasions from similar larvæ taken chiefly on *Ægle sepiaria* on which it is very common; therefore, I am well acquainted with it. The karatachi shrub is much used in the environs of Tokyo for ornamental hedges, and is very useful for that purpose because of its spines. I have also found the larva feeding on *inu-zanshō* (*Xanthoxylon schinnifolium* S. and Z.), which is also mentioned by Pryer as a food plant. Leech,[6] quoting Graeser, states that the larva feeds on *Phellodendron amurense* (Japanese name, *kiwada*) in Amurland, that it is greenish black, with irregular milk-white spots and bands, and that when sitting on the upper side of a leaf it resembles a bird-dropping. It is very true, as may be observed from the figures given of the young larvæ (Plate I, figs. 1 and 2), that they have this peculiar resemblance, but it only lasts up to the fourth molt, after which the larva assumes the green color which marks the last, or adult, stage. In the adult stage it closely resembles the larva of *P. demetrius* Cramer.

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[6] *Berl. ent. Zeitschr.* (1888), 32, 62.

This is an instance where the larva is first protected during the greater part of its existence by special protective resemblance and in its last stage by general protective resemblance, both apparently of a constant nature.

Up to the fourth molt it is evidently protected against enemies by special resemblance as the appearance of a bird-dropping is copied in outline and color as a protection against enemies. In its last stage it is protected by general resemblance as its green color harmonizes with the total artistic effect of its environment; namely, the foliage of the karatachi. (Table I, 1, procryptic colors, a and b).

Matsumura also gives the orange tree, *mikan* (*Citrus nobilis* Lour.), as a food plant.

The larva of *Papilio helenus* Linn., judging from the figure of the young larva by Kershaw,[7] seems to enjoy a similar protective resemblance, both the young and full-grown larvæ being somewhat like those of *P. xuthus*. Nawa[8] gives colored figures of the metamorphoses of *P. xuthus* and of an ichneumon fly parasitic on it, and represents the larva with two yellowish osmeteria, or nuchal horns, exserted from the junction of the head and the first thoracic segment. These give off a strong odor, and probably have an intimidating effect on enemies.

In the Tokyo Zoological Magazine (Tokyo Dōbutsugaku Zasshi), there is a good uncolored plate showing the metamorphoses of *P. xuthus*, but no allusion is made to this plate in the succeeding Japanese text, and the author, therefore, cannot be named. Seitz states that

> the larva is very similar to that of *P. bianor* Cramer; bright green; a grey, white-marked, transverse band on the third, fifth, and twelfth somites, a similar oblique band over the seventh and eighth segments; above the prolegs large, rounded, white spots. From June to November it is found on *Ægle sepiaria* and various fruit trees. The chrysalis is green, rarely brown; the anterior abdominal segments laterally somewhat swollen and carinate, caputal processes strongly developed; an obtuse, somewhat thornlike process on thorax.

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[7] Butterflies of Hongkong (1907), Pl. 4a, fig. 7.

[8] *Insect World* (1898), 2, 6, Pl. I.

Matsumura records *P. xuthus* from Hokkaido (Yezo), Honshu, Shikoku, and Kyushu, the Loochoo Islands (Ryukyu), Formosa, Ogasawara (Bonin Islands), Korea, China, Manchuria, and Amurland. He[9] also gives a short life history, accompanied by figures of the imago and larva. He says that there are three broods in the year and that it hibernates in the pupal stage. The nuchal horns of the larva are tolerably long, and the imago emerges in May or June. He refers here, no doubt, to typical *P. xuthus* which emerges in early summer. In December, 1912, I discovered its existence at an altitude of 2,800 meters (8,300 feet) in Luzon, at Pauai (Haight's Place), Benguet subprovince, where I collected 5 specimens. Semper does not record this species from the Philippines, so that it must be regarded as new to the fauna of these Islands. It is interesting to discover that it occurs so far south in the Indo-Malayan subregion at such an altitude. Jordan remarks that this, mainly Palæarctic species extends southward to Upper Burma and also occurs in Formosa, the Bonin Islands, and Guam and that Fruhstorfer has based upon a single male from Formosa the subspecies *koxinga*. I have myself taken *P. xuthus* in the Formosan mountains, and have observed it in the Japanese Islands from March to August and occasionally in September and October. *P. xuthulus,* which is the spring brood, appears first, coming out in March, followed in early summer by *P. xuthus*.

In Hokkaido (Yezo), in the extreme north of Japan, where the winter is long and severe, lasting until April, the spring form, *P. xuthulus,* does not emerge until June and the summer form, *P. xuthus,* follows in September, which is much later than in the southern latitudes of Japan with a warmer climate.

Subgenus **Cosmodesmus** Haase

Cosmodesmus HAASE, Bibl. Zool. Heft. (1892), **8**, 15; SEITZ, Macrolep. of the World, Faun. Pal. (1906), **1**, 14.

Papilio (Cosmodesmus) sarpedon Linnæus.

Pl. I, fig. 5, young larva; fig. 6, full-grown larva; fig. 7, pupa; fig. 8, food plant.

Japanese names, *aosuji-ageha* and *kuro-taimai.*

Papilio sarpedon LINNÆUS, Syst. Nat. (1767), **1**, 2,747; MOORE, Cat. Lep. Mus. E. I. C. (1857), **1**, 113, Pl. 3, fig. 8, larva; (*Dalchina*), Lep. Ind. (1903), **6**, 12, Pl. 471, figs. 1, 1a-1c, larva and pupa; imago, ♂ ♀; PRYER, Rhop. Nihon (1886), **5**, Pl. 1, fig. 9; Tokyo Zool. Mag. [Tokyo Dōbutsugaku Zasshi (Jap.)] (Aug. 15, 1891), **3**, No. 34,

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[9] Matsumura, Jap. Injurious Insects [Nihon Gaichūhen (Jap.)] (1899), 108, Pl. 46, fig. 1, imago; fig. 2, larva.

Pl. 5, fig. 1, ♂; fig. 2, ♀; fig. 3, larva first stage; fig. 4, larva fifth stage; fig. 5, pupa; LEECH, Butterfl. China, Japan, Corea (1892–1894), 2, 524; MACKINNON and NICÉVILLE, Journ. Bombay Nat. Hist. Soc. (1898), 11, Pl. W, figs. 26a, b, pupa; SCOTT, Austral. Lep. Mus. Austral. (1898), 2, Pl. 17; MIYAJIMA, Jap. Butterfl. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 79, Pl. V, fig. 2, ♂; Dyar, Proc. U. S. Nat. Mus. (1905), 28, 937, fig. 1, larva; MATSUMURA, Cat. Insect. Jap. (1905), 3, No. 14; MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)] (1907), 4, 65, Pl. 64, fig. 1, ♀; KERSHAW, Butterfl. Hongkong (1907), 113, Pl. 13, fig. 5; SEITZ, Macrolep. of the World, Faun. Pal. (1906), 1, 15, Pl. 8c; JORDAN, Seitz's Macrolep. of the World, Faun. Indo-austral. (1909), 9, 94.

Dalchina teredon FELDER, Verh. Zool.-bot. Ges. Wien (1864), 14, 305; MOORE (*Dalchina*), Lep. Ceyl. (1881), 1, 143, Pl. 62, figs. 1, 1a-1b, ♂ ♀, larva and pupa; MOORE (*Dalchina*), Lep. Ind. (1903), 6, 14, Pl. 472, figs. 1, 1a-1c, larva and pupa, ♂ ♀.
Bomb. Nat. Hist. Soc. (1890), 5, 364.

Papilio sarpedon DAVIDSON and AITKEN, nec Linn. (= *teredon*), Journ. Bomb. Nat. Hist. Soc. (1890), 5, 364.

The full-grown larva figured (Plate I, fig. 6) was taken in September, 1900, at Yoshino, Yamato Province, on *tabu-no-ki* (*Machilus thunbergii* S. and Z.), a species of the Lauraceæ. It pupated on September 11, 1900, and a female specimen emerged on May 1, 1901. A male specimen was bred from a similar larva on May 3, 1901. These two specimens are probably referable to *P. sarpedonides* Fruhst., but as they are not before me I am unable to say whether they should be assigned to the spring form, *P. sarpedonides*, or the summer form, *P. nipponus*. Moore describes the larva and pupa of *P. sarpedon* as follows.[10]

Larva.—"Smooth, thickened from the second to the 5th segment, and thence decreasing to the end; with two short subdorsal fleshy spines on the 4th segment, between which is a transverse pale yellow line, two shorter spines also on the second and third, and two on the anal segment; color, green, with a longitudinal posterior lateral and lower pale yellowish line."

Pupa.—"Conical, truncated in front; thorax produced into a lengthened obtusely pointed frontal process."

The spines on segments 2 and 3 are not well represented in my figure of the adult larva (Plate I, fig. 6).

Kershaw states that both larva and pupa are very much like those of *P. eurypilus* Linn. and that, in Hongkong, the larva feeds on citrus plants and on *Laurus camphora*.

Mackinnon and Nicéville[11] figure the pupa, but not having access to the volume in which the illustration occurs I have been unable to examine their figures.

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[10] Lep. Ind. (1903), 6, 12, Pl. 471, figs. 1, 1a-1c, larva and pupa.

[11] *Journ. Bombay Nat. Hist. Soc.* (1898), 11, Pl. W, figs. 26 a, b, pupa.

Seitz remarks[12] that—

> the larva is green, with two pointed tubercles anteriorly and at the anus, bearing also two small points on each side of the third and fifth segments, on Aurantiaceæ. Dorsal thoracical projection of the pupa strongly acuminate.

Jordan states[13] that—

> the young larva is black or dark green, with numerous spines, of which those on the metathorax are long and bristly; when full grown green, beneath lighter, with a pair of short spines on each of the three thoracic segments and on the last segment; on the metathorax a yellow transverse band and from the metathorax to the anal segment a yellowish stripe above the legs; on *Machilus odoratissima, Geijera salicifolia, Litsaea, Alseodaphne,* etc., and especially *Camphora officinalis,* where this tree has been imported. Pupa green, the thoracic horn slenderer, more pointed and straighter than in the allied species, the lateral ridges extending downwards from the horn straight, between this carina and the frontal one a very slight, somewhat curved vertical ridge.

Pryer states that the larva feeds on the young leaves of the evergreen, *Machilus thunbergii,* and that its color resembles very closely that of the young green leaves of this tree.

Butler[14] records *P. teredon* Feld., from Nikko, Central Japan; this is the Ceylon form of the species, and according to Moore's figure of the imago only differs from typical *P. sarpedon* in the narrower band of the forewing and in having the anal angle of secondaries more produced.

Moore describes the larva of *P. teredon* as follows:

> Larva smooth, green, with a paler lower lateral line, and a dorsal band ending in a lateral tubercular spot on fourth segment; a pair of short tubercles on front and anal segment. Pupa green, with lateral and dorsal longitudinal yellowish streaks. Feeds on *Cinnamomcum* [sic].

Davidson and Aitken describe the larva of *teredon* as follows:

> *Larva.*—"Very like that of *agamemnon* but prettier, being of a soft dark green, inclining to emerald and passing into a pale bluish on the last segment and the underparts."
>
> *Pupa.*—"Easily distinguished from that of *agamemnon* by one mark, viz., the horn is not straight but curves slightly backwards."

In the Tokyo Zoological Magazine (Tokyo Dōbutsugaku Zasshi), already cited, there is a good uncolored plate showing the metamorphoses of *P. sarpedon,* but no allusion is made to this plate in the succeeding Japanese text and the author, therefore, cannot be named. He gives black and white figures of the larva in its first and fifth stages, of the pupa, and of the imago.

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[12] Macrolep. of the World, Faun. Pal. (1906), 1, 15.

[13] Seitz's Macrolep. of the World, Faun. Indo-austral. (1909), 9, 94.

[14] *Ann. & Mag. Nat. Hist.* (1881), V, 7, 133.

Matsumura records *P. sarpedon* from Hokkaido (Yezo), Honshu, Shikoku, Kyushu, and Formosa. Miyajima records it also from the Loochoo Islands (Ryukyu), and states that it feeds upon *inu-gusu*. Inu-gusu as well as *shiro-gusu*, are merely other Japanese names for *tabu-no-ki*, previously referred to as the food plant on which I bred the larva; that is, *Machilus thunbergii*. The imago flies from May to September. Matsumura also gives *Machilus japonica* S. and Z. (*ao-gashi*) as a food plant.

Jordan states[15] that "*sarpedon* occurs from China and South Japan to the Solomon Islands in numerous geographical forms."

The forms which are geographically connected with China, Japan, and the Philippines are as follows:

Papilio nipponus FRUHST. (= *morius* Fruhst.), Seitz, 1, Pl. 8c (described as *sarpedon*), from Japan and the Loochoo Islands (Ryukyu).

Papilio sarpedonides FRUHST., f. vern., spring form from Japan.

Papilio nipponus is the Japanese race separated into spring and summer forms which differ in the bands of the forewing being broad in *sarpedonides* and narrower in *nipponus*.

Papilio connectens FRUHST., from Formosa and Loochoo Islands (Ryukyu).

Papilio semifasciatus HONR., from southeastern, central, and western China.

Papilio sarpedon LINN., typical (= *demophon* Meerb. nec. Linn.; *demophoon* Shaw; *luctatius* Fruhst.; *hagus* Fruhst.; colus Fruhst.); (Seitz, 9, pl. 44d); distributed from Hainan, Tonkin, and North India to the Philippines and Lombok. In the broad-banded specimens the median and submedian veins are more or less white inside the band of the forewing. In the summer specimens of the northern districts, f. aest. *melas* Fruhst. (= *demophoon* Shaw), the band is narrower and the veins are black.

Subgenus Pharmacophagus Haase

Pharmacophagus HAASE, Bibl. Zool. Heft (1892), 8, 15; Seitz, Macrolep. of the World, Faun. Pal. (1906), 1, 8.

Papilio (Pharmacophagus) alcinous Klug.

Pl. II, fig. 12, full-grown larva; fig. 13, dorsal aspect of segment; figs. 14–16, pupa.

Japanese names, *jako-ageha*, *yama-jorō*.

Papilio alcinous KLUG, Neue Schmett. (1836), 1, Pl. 1, figs. 1–4; PRYER, Rhop. Nihon (1886), 4, Pl. 3, fig. 3, ♀; Tokyo Zool. Mag. [Tokyo Dōbutsugaku Zasshi (Jap.)] (Aug. 15, 1891), 3, No. 34, Pl. 4, fig. 1, imago, ♂; fig. 2, imago, ♀; fig. 3, larva 5th stage; fig. 4, pupa; LEECH, Butterfl. China, Japan, Corea (1892–1894), 2, 539; DYAR, Proc. U. S. Nat. Mus. (1905), 28, 938, fig. 2, larva; MATSUMURA, Cat. Insect.

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[15] Seitz's Macrolep. of the World, Faun. Indo-austral. (1909), 9, 95.

Jap. (1905), 1, 2, No. 8; MATSUMURA, Thousand Insects of Japan [Nihon Senchū-Dzukai (Jap.)] (1907), 4, 60, Pl. 62, fig. 2, ♀; SEITZ, Macrolep. of the World, Faun. Pal. (1906), 1, 9, Pl. 2 a, ♂ ♀; 2 b, ♂ ♀, f. aest.; JORDAN, Seitz's Macrolep. of the World, Faun. Indo-austral. (June 20, 1910), 9, 33; MIYAJIMA, Jap. Butterfl. [Nihon Chō-rui Dzusetsu (Jap.)] (1904), 76, Pl. 3, fig. 2, ♀; 71 (woodcut), ova, fig. 1; larva, fig. 2; pupa, fig. 3.

The pupa figured (Plate II, figs. 14–16) was taken at Kobe, Settsu Province, Honshu, in July, 1901, and a male specimen of *P. alcinous* emerged from it, but no record was kept of the date. The larva figured (Plate II, fig. 12) was taken while it was crawling upon the ground, at the same locality, in August, 1901, and pupated, but the imago failed to emerge. The pupa taken in July, 1901, was similar in all respects to the one resulting from the larva of August, 1901, and I am satisfied that the two pupæ are of the same species. I have also compared the figures of my pupa with that shown by Miyajima.[16] He gives a good woodcut in which the larva, pupa, and ova of *P. alcinous* Klug are figured, together with the food plant, and states that the larva feeds upon the following plants: *Uma-no-suzukusa* (*Aristolochia debilis* S. and Z.); *ikema* (*Cynanchum caudatum* Maxim.); *kaga-imo*, scientific name unknown; *ao-tsuzura* (*Cocculus thunbergii* DC.), also known as *tsuzura-fuji*. The larva figured by him also agrees with my original figure (Plate II, fig. 12), so that, although no imago ever developed from my larva, I have no hesitation in referring it to *P. alcinous*. Nawa[17] also gives a black and white figure of the pupa which agrees with my figures as to form, but he does not give one of the larva. In the Tokyo Zoölogical Magazine [Tokyo Dōbutsugaku Zasshi (Jap.)], there is a good uncolored plate showing the metamorphoses of *P. alcinous*, but no allusion is made to this plate in the succeeding Japanese text and, therefore, the author cannot be named.

Pryer states that the larva feeds on *Cocculus thunbergii* DC., and resembles a partially ripe mulberry and that the pupa is most beautifully sculptured. The figures given (Plate II, figs. 14–16) fully bear out his description of the pupa which is yellowish in color and most delicately chiseled. Jordan describes the larva as follows:

> Larva olive-brown, with numerous dark, light-edged spots; on the 6th and 7th segments a very broad red-white oblique girth, which is dorsally interrupted or strongly constricted; the tips of the tubercles reddish, the upper lateral projections of the prothorax pale red with dark tips.

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[16] Japanese Butterflies (1904), 71.

[17] Insect World (Konchū Sekai) (1907), 11, 559.

Dyar[18] remarks that—

> the larva of *Papilio alcinous* Klug is allied to the American *philenor*, and retains in the last stage the peculiar black and white coloration, resembling bird excrement, so characteristic of most all young Papilios.

Seitz and Jordan[19] give many forms of the *P. alcinous* group which is distributed from Japan to western China and Tonkin. Seitz remarks that "*P. alcinous* Klug is a black, geographically variable, *Papilio* which inhabits the Pacific district of the Palæarctic region" and that "it is almost exclusively Palæarctic, only a few forms entering the most northern districts of the Oriental Region." The forms given by them are quoted for convenience of reference, although only three of them inhabit Japan proper; the rest are mostly Chinese.

Papilio alcinous KLUG (Seitz, 1, 9, Pl. 2a, 2b) (= *spathatus* Butl., *hæmatostictus* Butl.), from Japan.

Papilio nagasakii FRUHST. (Seitz, 1, Pl. 2a, ♂ ♀; Pl. 2b, ♂ ♀, f. aest), from southern Hokkaido (Yezo), Honshu, and Kyushu.

Papilio confusus ROTHSCH. (Seitz, 1, Pl. 2c, ♂ ♀), from China, southward to Yunnan.

Papilio plutonius OBERTH. (Seitz, 1, Pl. 2c, ♂ ♀), from central China and Tibet.

Papilio dæmonius ALPHÉR. (= *fatuus* Rothsch.), from Ta-tsien-lu, western China and Tibet.

Papilio impediens ROTHSCH. (Seitz, 1, Pl. 3a), from Ta-tsien-lu, western China.

Papilio mencius FELD. (Seitz, 1, Pl. 2b, ♂ ♀), from central and southeastern China.

Papilio bradanus FRUHST. (= *intermedia* Oberth.) (Seitz, 9, 33), from the Sannan group (Ishigaki-Shima, Loochoo Islands).

Papilio decora OBERTH. ab. (Seitz, 9, 33), locality not given.

Papilio loochooanus ROTHSCH. (Seitz, 9, Pl. 19c, ♂; r. 1, Pl. 1c, ♀, underside), from the Loochoo Islands (Ryukyu).

Papilio mansonensis FRUHST. (= *mausonensis* Fruhst.) (Seitz, 9, 33); from Formosa, eastern and central China (westward to Chang-yang), and Tonkin; the male is not distinguishable from the species from western China, *P. confusus*, but the female is as pale as in *P. loochooanus*.

According to Matsumura, *P. alcinous* occurs in Honshu, Shikoku, Kyushu, and the Loochoo Islands (Ryukyu); also, in Korea and China. It flies from March to September in two broods, spring and summer, both of which are figured by Seitz.

The following description of a *Papilio* larva was entered in my notebook on May 2, 1908. The larva was taken by me at Kanshirei, in southern Formosa, but unfortunately never pupated, so that no imago emerged for identification. From its resemblance to the larva of *P. alcinous* Klug, I thought it would probably turn out to be the larva of a species closely allied to *P. alcinous* which was flying at Kanshirei at an altitude of 300 meters (1,000 feet). I captured several specimens of this species which I believe is referable to *P. febanus* Fruhst.[20]

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[18] Dyar, *Proc. U. S. Nat. Mus.* (1905), 28, 938, fig. 2, larva.

[19] Macrolep. of the World, Faun. Pal. (1906), 1, 9, and Faun. Indo-austral. (1909), 9, 33.

Description.—White lateral stripe on side of segment 7 not quite meeting on the dorsum and ending in fleshy, white tubercles on dorsum; lateral, white, fleshy tubercles on segment 10 and two on dorsum of segment 10; lateral white tubercles also on segment 6, from which segment the lateral white band on the side of segment 7 commences, so that there is an oblique white band on segments 6, 7, not quite meeting on the dorsum; all other tubercles claret colored, red tipped; chocolate-colored diamond pattern mediodorsal stripe on dorsum; three rows of tubercles: subdorsal, subspiracular, and suprapedal.

A comparison of the foregoing description with my figure of the larva of Japanese *P. alcinous* (Plate II, fig. 12) shows a striking resemblance.

According to Seitz, the Japanese forms of *P. alcinous* are not taken in Formosa, and I have never taken them myself at Kanshirei, although of course they may possibly occur there. The only form of *P. alcinous* which is at present known to occur in Formosa is *P. mansonensis* Fruhst., so that if my larva described above be not that of the Japanese *P. alcinous* it may belong either to *P. febanus* Fruhst. or *P. alcinous* var. *mansonensis* Fruhst.

I may mention that Kanshirei is the Japanese pronunciation of the Chinese ideographs with which Koannania is written and that it was at Koannania that Matsumura took his type of *P. koannania* (= *febanus* Fruhst.).

SATYRIDÆ

Genus NEOPE Butler

Neope BUTLER, Ann. & Mag. Nat. Hist. (1867), III, 19, 166; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 89; FRUHST, Faun. Indo-austral. (1911), 9, 324.

Neope goschkevitschii Ménétries.

Pl. II, fig. 7, larva; figs. 8–9, dorsal aspect of segments; fig. 10, head; fig. 11, food plant.

Japanese name, *kimadara-hikage.*

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[20] Seitz, Macrolep. of the World, Faun. Indo-austral. (1909), 9, 33.

Lasiommata goschkevitschii MÉN., Cat. Mus. Petr. (1855), 2, 121, Pl. 10, fig. 4; LEECH, Butterfl. China, Japan, Corea (1892–1893), 1, 52; NAGANO, Nawa's Insect World [Konchū Sekai (Jap.)] (August 15, 1910), 14, 418, Pl. 17, figs. 1–6, transf.; SEITZ, Macrolep. of the World, Faun. Pal. (June, 1908), 1, 90, Pl. 33c, ♂ ♀; FRUHST., Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 324.

Lasiommata gaschkevitschii FELDER, Wien, ent. Mon. (1862), 6, 28; PRYER, Rhop. Nihon (1889), 32, Pl. 9, fig. 11; MATSUMURA, Cat. Insect Jap. (1905), 1, 14, No. 109; MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)] (1907), 4, 101, Pl. 72, fig. 8, ♀; MIYAJIMA, Jap. Butterfl. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 150, Pl. 16, fig. 8.

Neope niphonica BUTL., Ann. & Mag. Nat. Hist. (1881), V, 7, 133.

Neope japonica BUTL. Ann. & Mag. Nat. Hist. (1867), III, 19, 167.

The larva figured (Plate II, fig. 7) was taken in July, 1901, at Yoshino, Yamato Province, Honshu, on bamboo grass, *sasagusa* (? *Lophatherum elatum* Zoll.). The imago failed to emerge from the pupa resulting from this larva. Nagano gives lengthy descriptions of the metamorphoses of this species including a figure of the larva in his plate which agrees with my colored figure. I am unable to follow the written description of his larva with accuracy as it is in technical Japanese language, and have therefore depended only on his figure for identification. I think, however, that there can be no doubt that my larva is identical with that of *N. goschkevitschii*, figured by Nagano on a species of bamboo.

The following description is taken from my original figure.

Larva.—Length, 32 millimeters. Grayish brown with a yellow tinge; faint longitudinal mediodorsal dark lines; subdorsal dark spots and crosses; midlateral longitudinal dark line; series of dark spiracular blotches; yellowish longitudinal subspiracular stripe.

Matsumura records this species from the Hokkaido (Yezo), Honshu, Kyushu, and Shikoku, where it is very common. I have captured it in all those islands from April to August.

Fruhstorfer[21] remarks that "*N. goschkevitschii* reaches the farthest north and inhabits all the islands from Hokkaido (Yezo) to Formosa" and gives the following races:

Neope japonica Butler, described from Hakodate, Hokkaido (Yezo).
Neope watanabei Mats., from Formosa (Hoppo).

Fruhstorfer does not mention *N. niphonica* Butl. which was described in 1881 from Nikko, Honshu.

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[21] Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 324.

Genus LETHE Hübner

Lethe HÜBNER, Verz. bek. Schmett. (1827), 56; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 82; FRUHST, Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 321.

Subgenus Kirrodesa Moore

Kirrodesa MOORE, Lep. Ind. (1892), 1, 237.

Lethe (Kirrodesa) sicelis Hewitson.

Pl. II, fig. 1, larva; fig. 2, head; figs. 3–4, dorsal aspect of segments; fig. 5, pupa; fig. 6, food plant.

Japanese name, *hikage-chō.*

Debis sicelis HEWITSON, Exot. Butterfl. (1862), 3, Pl. 1, fig. 3.

Lethe sicelis PRYER, Rhop. Nihon (1889), 32, Pl. 9, fig. 10; LEECH, Butterfl. China, Japan, Corea (1892–1893), 1, 36; MATSUMURA, Cat. Insect, Jap. (1905), 1, 14, No. 113; MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)], 4, 98, Pl. 72, fig. 1, ♀; SEITZ, Macrolep. of the World, Faun. Pal. (1906), 1, 84, Pl. 31b; NAGANO, Nawa's Insect World [Konchū Sekai (Jap.)] (1910), 14, 590, Pl. 24, figs. 1–12, transf.; MIYAJIMA, Jap. Butterfl. [Nihon Chōrui Dzusetsu (Jap.)], (1904), 146, Pl. 16, fig. 3; FRUHST., Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 322.

The larva figured (Plate II, fig. 1) was taken in July, 1901, at Kobe, Settsu Province, on bamboo grass, *sasa-gusa,* (? *Lophatherum elatum* Zoll.). From this an imago emerged, but no record was kept of the date of emergence nor of the sex. A second larva was taken by me, also on sasa, on September 9, 1900; this pupated on September 20, and emerged on September 25, 1900. The pupa figured is the pupa of the second larva. I have also taken the larva of this species on *kaya* (? *Torreya nucifera* S. and Z.), a kind of reed grass, and on *tsubana* (? *Imperata arundinacea* Cyr.), a species of grass. Two males and one female were bred by me at Kobe from the larvæ, June 7 and 8, 1901.

The following descriptions are taken from my original figures.

Larva.—Length, 39 millimeters. Yellowish green; green mediodorsal longitudinal stripe edged with yellow lines on each side; yellow midlateral and whitish suprapedal longitudinal stripes; horns of head pink tipped.

Pupa.—Light green with two rows of four white spots on the dorsum. Suspended by tail from food plant.

Pryer remarks that he took the larva of *L. sicelis* and believes that it feeds on bamboo grass. Matsumura records the species from Honshu, Shikoku, and Kyushu, but not from Hokkaido (Yezo), where it does not seem to occur. Miyajima gives its season of flight as being from July to August, but I have taken it in various localities in the islands enumerated by Matsumura from May to September. Pryer says that it goes only a short distance up the mountains, where it is replaced by *L. diana* Butler. However, I have taken specimens up to an altitude of from 300 to 500 meters (1,000 to 1,500 feet) on the mountains of Ōmine-san and Ōdai-san in Yamato Province, Honshu. In Tosa Province, Shikoku Island, it occurs in May, and I have taken it at Nikko, Honshu, in the same month at an elevation of about 500 meters (1,500 feet).

Fruhstorfer[22] describes a distinct race of *L. sicelis* from Kyushu, which he names *vanelia*. It is characterized by the absence of the gray- or blue-violet bordering to the eyespots on the underside of the hind wing which is always present in examples from Hondo (Honshu) and which Hewitson and Seitz[23] distinctly figure.

Subgenus Rangbia Moore

Lethe HÜBNER, Verz. bek. Schmett. (1827), 56; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 82.

Rangbia MOORE, Lep. Ind. (1890–1892), 1, 232; FRUHSTORFER, Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 322.

Lethe (Rangbia) diana Butler.

Pl. III, fig. 1, larva; fig. 2, head; figs. 3–4, dorsal aspect of segments; figs. 5–6, pupa; fig. 7, food plant.

Japanese name, *kuro-hikage.*

Debis diana BUTLER, Journ. Linn. Soc. Zool. (1866), 9, 55; PRYER, Rhop. Nihon (1889), 32, Pl. 9, fig. 12; OBERTHÜR, Étud. d'Entom. (1881), 6, 16, Pl. 7, fig. 2; LEECH, Butterfl. China, Japan, Corea (1892–1893), 1, 28; MATSUMURA, Cat. Insect Jap. (1905), 1, 14, No. 112; MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)] (1907), 4, 108, Pl. 73, fig. 10, ♀; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 84, Pl. 31a; FRUHSTORFER, Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 322; MIYAJIMA, Jap. Butterfl. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 147, Pl. 16, fig. 4.

Lethe whitelyi BUTLER, Ann. & Mag. Nat. Hist. (1867), III, 20, 403, Pl. 9, fig. 8.

Lethe consanguis BUTLER, Ann. & Mag. Nat. Hist. (1881), V, 7, 133.

The larva figured (Plate III, fig. 1) was taken on June 3, 1902, at Hakodate, Oshima Province, Hokkaido (Yezo), on bamboo grass, *sasa-gusa* (? *Lophatherum elatum* Zoll.). It pupated on June 15, 1902, and a female imago emerged on July 3, 1902. A male and female emerged from similar larvæ on June 27 and July 2, 1902.

The following descriptions are taken from my original figures.

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[22] Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 322.

[23] Seitz's Macrolep. of the World, Faun. Pal. (1906), 1, 84, Pl. 31b.

Larva.—Length, 27 millimeters. Pinkish gray; dark mediodorsal pattern; spiracles black; whitish suprapedal longitudinal line.

Pupa.—Bronze-brown with lighter reflections and black dots; two short white lines on the dorsum extending one-third way from tail; mediodorsal white line on dorsum extending half way from tail and continuing black; suspended by the tail from the food plant.

Matsumura records this species from Hokkaido (Yezo), Honshu, Shikoku, and Kyushu; also, from Korea and China. I have taken it from May to August, and have noticed that in Honshu and Kyushu it appears to be a mountain butterfly, while in Hokkaido it inhabits the plains. As far as I am aware, no figure or description of the larva has been published before.

Fruhstorfer[24] lists the following forms of *L. diana.*

Lethe diana Butl., described from Hakodate, Hokkaido (Yezo).
Lethe consanguis Butl., aberration from Nikko, Hondo (Honshu).
Lethe celeja Fruhst., subspecies, normal form (= figure given in Seitz, 1, Pl. 31a), from Hondo (Honshu).
Lethe whitelyi Butl., from Nagasaki, Kyushu.
Lethe fixseni Butl., subspecies from Korea.

"*Diana* is the only Lethe which bears a long hair tuft on the underside of the forewing, placed below the submedian."

Subgenus Tansima Moore

Lethe HÜBNER, Verz bek. Schmett. (1827), 56; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 82.
Tansima MOORE, Lep. Ind. (1890–1892), 1, 271.

Lethe (Tansima) marginalis Motschulsky.

Pl. III, fig. 17, larva; fig. 18, head; fig. 19, dorsal aspect of segment; fig. 20, food plant; figs. 21–22, pupa.

Japanese name, *kuro-hikage-modoki.*

Satyrus marginalis MOTSCHULSKY, Étud. d'Entom. (1860), 9, 29; LEECH, Butterfl. China, Japan, Corea (1892–1893), 1, 25; SEITZ, Macrolep. of the World, Faun. Pal. (June 23, 1908), 1, 86, Pl. 31d, ♂ ♀; MIYAJIMA, Jap. Butterfl. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 147, Pl. 16, fig. 5.

Lasiommata maacki BREMER, Bull. Acad. Petr. (1861), 3, 468; BREM., Lep. Ost.-Sib. (1864), 22, Pl. 3, fig. 3; MATSUMURA, Cat. Insect Jap. (1905), 1, 14, No. 111; (*Lethe*), MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)] (1907), 4, 101, Pl. 72, fig. 7, ♀.

The larva figured (Plate III, fig. 17) was taken in June, 1901, at Yoshino, Yamato Province, on *susuki,* a species of grass (? *Miscanthus sinensis* Anders.), and a female imago emerged from the pupa resulting from this larva on June 23, 1901.

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[24] Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 322.

Three males also emerged on July 6 and 11, 1901, from other larvæ taken about the same time.

The following descriptions are taken from my original figures.

Larva.—Length, 48 millimeters. Yellowish green; horns on head pink tinged; mediodorsal longitudinal dark green stripe; subdorsal midlateral supraspiracular longitudinal green stripes; whitish longitudinal suprapedal stripe.

Pupa.—Yellowish green; three darker lines on dorsum; wing cases edged with yellow. Suspended from food plant by tail.

Matsumura records the species from Hokkaido (Yezo) and Honshu and also from Formosa, Korea, China, and eastern Siberia (Ussuri and Amurland). I have taken the imago in Yamato Province, Honshu, and also in Iyo Province, Shikoku. It appears to be a mountain species except in Hokkaido, where it inhabits the plains. It flies in July and August.

Subgenus **Harima** Moore

Lethe HÜBNER, Verz. bek. Schmett. (1827), 56.

Harima MOORE, Lep. Ind. (1892), 1, 299 (type, *callipteris* Butl.).

Sinchula MOORE, Lep. Ind. (1892), 1, 275; FRUHSTORFER, Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 313.

Lethe (Harima) callipteris Butler.

Pl. III, figs. 23–24, dorsal aspect of segments; fig. 25, head; fig. 26, larva; figs. 27–28, pupa; fig. 29, food plant.

Japanese name, *hime-kimadara-hikage.*

Neope callipteris BUTLER, Ann. & Mag. Nat. Hist. (1877), IV, 19, 92; PRYER, Rhop. Nihon (1889), 32, Pl. 10, fig. 2; LEECH, Butterfl. China, Japan, Corea (1892–1893), 1, 36, Pl. 6, figs. 3 ♂, 4 ♀; MIYAJIMA, Jap. Butterfl. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 148, Pl. 16, fig. 6; MATSUMURA, Cat. Insect. Jap. (1905), 1, 14, No. 110; MATSUMURA, Thousand Insects of Japan [Nihon Senchū Dzukai (Jap.)] (1907), 4, 103, Pl. 72, fig. 10, ♀; SEITZ, Macrolep. of the World, Faun. Pal. (June 23, 1908), 1, 86, Pl. 31e.

The larva figured (Plate III, fig. 26), was taken in June, 1902, at Hakodate, Oshima Province, Hokkaido (Yezo), on bamboo grass, *sasa-gusa* (? *Lophatherum elatum* Zoll.). It pupated on July 4, 1912, and a female imago emerged from the pupa resulting from it on July 19, 1902. A male emerged on August 10, 1902, from a second larva taken.

The following descriptions are taken from my original figures.

Larva.—Length, 35 millimeters. Bluish green; mediodorsal longitudinal green stripe edged with yellow lines; subdorsal and midlateral longitudinal yellow stripes; white suprapedal longitudinal stripe; horns of head tipped with pink.

Pupa.—Bluish green; four rows of white spots on dorsum and thorax. Suspended by tail from food plant.

This species appears to be confined to the Japanese Islands. Matsumura records it from Hokkaido (Yezo), Honshu, and Kyushu, and I have taken it in Kyushu. It flies from July to September.

Pryer states that it is a mountain insect. This is quite true in Honshu and Kyushu Islands, as I discovered when collecting there, but at Hakodate in Hokkaido, which is a great deal farther north, it inhabits the plains as well as the mountains, like several other species, which in the more southern parts of Japan are only found in the mountains, but which in Hokkaido occur commonly in the plains; for example, *Vanessa io* Linn. and *Lasiommata epimenides* Mén. I found *L. callipteris* especially abundant in July and August on the summit of the Raiden Tōge (Raiden Pass), in Hokkaido, at an elevation of 500 meters (1,500 feet) where the vegetation mainly consisted of bamboo grass, or sasa, the food plant of the larva.

Seitz[25] remarks:

> *L. callipteris* has the appearance of being a small form of *labyrinthea* Leech, from central and western China in July, but the male is without the dentate bandlike scent organ found in that species. *Callipteris* has, hitherto, only been known from Japan; the specimen from which our figure is taken and which belongs to Tring Museum, England, however bears the locality "Kashmir." If that be not an error in labeling, I am inclined to regard *callipteris* Butl. and *labyrinthea* Leech, in spite of the difference in the scent organ, as being localized forms of one widely distributed species.

Genus MYCALESIS Hübner

Mycalesis HÜBNER, Verz. bek. Schmett. (1827), 55; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 80; FRUHSTORFER, Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 330.

Subgenus Sadarga Moore

Sadarga MOORE, Tr. Ent. Soc. Lond. (1880), 157.

Mycalesis (Sadarga) gotama Moore.

Pl. III, fig. 8, larva; fig. 9 head; figs. 10–11, dorsal aspect of segments; fig. 12, food plant; figs. 13–14; pupa; figs. 15–16, pupa previous to emergence.

Japanese name, *hime-janome.*

Mycalesis gotama MOORE, Cat. Lep. E. I. C. (1857), 1, 232; PRYER, Rhop. Nihon (1889), 30, Pl. 9, fig. 1; LEECH, Butterfl. China, Japan, Corea (1892–1893), 1, 14; NAWA, Insect World [Konchū Sekai (Jap.)] (1900), 4, 373, Pl. 10, figs. transf. larva, pupa, imago, food plant; MIYAJIMA, Jap Butterfl. [Nihon Chōrui Dzusetsu (Jap.)] (1904), 145, Pl. 16, fig. 1; MATSUMURA, Cat. Insect Jap. (1905), 1, 15, No. 118; MATSUMURA, Thousand Insects of Japan [Nihon

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[25] Macrolep. of the World, Fauna Pal. (1908), 1, 86.

Senchū Dzukai (Jap.)] (1907), 4, 99, Pl. 72, figs. 6 ♂, 2 ♀; SEITZ, Macrolep. of the World, Faun. Pal. (1908), 1, 81, Pl. 29c, ♂ ♀; FRUHSTORFER, Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 348.

Mycalesis borealis FELD. and ROGEN., Reise Novara (1867), 500.

The larva figured (Plate III, fig. 8) was taken in July, 1901, at Yoshino, Yamato Province, Honshu, on bamboo grass, *sasa-gusa* (? *Lophatherum elatum* Zoll.), and a female imago emerged from the pupa resulting from it on August 9, 1901.

The following descriptions are taken from my original figures.

Larva.—Length, 30 millimeters. Yellowish green; dark green mediodorsal longitudinal line edged with yellow; yellow subdorsal longitudinal line.

Pupa.—Green with two lines of four white spots on the dorsum; suspended by the tail from food plant; it is green for some time after pupation, and, as in the case of the pupæ of many other Lepidoptera, turns brown before emergence (Plate III, figs. 15 and 16). Three males and two females also emerged at later dates from similar larvæ. There is another form of the larva which, instead of being green, is a dirty grayish brown with the dorsal and subdorsal lines dark. On May 12, 1901, I found a larva of this form at Yoshino from which an imago of *gotama* emerged on May 31, 1901. The color of this larva, however, may have been due to the fact that it was preparing to pupate as the larvæ of many Lepidoptera change color before entering on the pupal stage.

Nawa[26] gives a black and white figure of the larva of this species, together with its transformations. Matsumura records its occurrence in Honshu, Shikoku, Kyushu, and Ryukyu (Loochoo Islands). I have taken it in Honshu, Kyushu, and Shikoku, from May to September. Miyajima records it from Hokkaido (Yezo), but I have never taken it there, and Matsumura does not record it from that island. Rice is given as its food plant by Matsumura.

Fruhstorfer[27] remarks:

> *M. gotama*, an East Asiatic collective species, which inhabits the Japanese Islands from Hondo (Honshū) onwards, has spread from central and western China to Annam and Upper Assam.

He also gives the following subspecies, races, and forms which are referable to *M. gotama*.

Mycalesis gotama Moore, subspecies from Shanghai, China.

Mycalesis borealis Feld., subspecies from China and Japan (Nagasaki, Kyushu Island).

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[26] *Insect World* (*Konchū Sekai*) (1900), 4, 373, Pl. 10.

[27] Seitz's Macrolep. of the World, Faun. Indo-austral. (1911), 9, 348.

Mycalesis fulginia Fruhst., form of *M. borealis*, from Japan (Kyushu Island).

Mycalesis seriphus Fruhst., Seitz, 1, Pl. 29c, from Japan, Honshu Island.

Mycalesis madjicosa Butler, Seitz, 9, 92 d. ♀; island race; described by Butler from Madjico-shima in Cat. Satyr. Brit. Mus. (1868), 135, Pl. 3, fig. 10. Madjico-shima (recte ? Majiko-shima) is undoubtedly a Japanese island but I have been unable to trace its geographical position; it is probably one of the Loochoo Islands; specimens are in the Fruhstorfer collection from Ōshima, one of the Loochoo Islands, and from Ishigaki-shima, which is situated in the southern or Miyako group of the Loochoo Islands (Ryukyu).

Mycalesis nanda Fruhst., subspecies from Tainan and Horisha in Formosa.

Mycalesis charaka Moore, subspecies from India, Tonkin, and Assam.

Mycalesis oculata Moore, dry season form, from Assam and Bhamo, Burma.

ILLUSTRATIONS

(Drawings by Hisashi Kaidō)

PLATE I

FIGS. 1 to 4. *Papilio xuthus* Linnæus.
1 and *2*, young larvæ; *3*, full-grown larva; *4*, food plant.
5 to 8. *Papilio* (*Cosmodesmus*) *sarpedon* Linnæus.
5, young larva; *6*, full-grown larva; *7*, pupa; *8*, food plant.

PLATE II

FIGS. 1 to 6. *Lethe* (*Kirrodesa*) *sicelis* Hewitson.
1, larva; *2*, head; *3* and *4*, dorsal aspect of segments; *5*, pupa; *6*, food plant.
7 to 11. *Neope goschkevitschii* Ménétries.
7, larva; *8* and *9*, dorsal aspect of segments; *10*, head; *11*, food plant.
12 to 16. *Papilio* (*Pharmacophagus*) *alcinous* Klug.
12, full-grown larva; *13*, dorsal aspect of segment; *14* to *16*, pupa.

PLATE III

FIGS. 1 to 7. *Lethe* (*Rangbia*) *diana* Butler.
1, larva; *2*, head; *3* and *4*, dorsal aspect of segments; *5* and *6*, pupa; *7*, food plant.
8 to 16. *Mycalesis* (*Sadarga*) *gotama* Moore.
8, larva; *9*, head; *10* and *11*, dorsal aspect of segments; *12*, food plant; *13* and *14*, pupa; *15* and *16*, pupa previous to emergence.
17 to 22. *Lethe* (*Tansima*) *marginalis* Motschulsky.
17, larva; *18*, head; *19*, dorsal aspect of segment; *20*, food plant; *21* and *22*, pupa.
23 to 29. *Lethe* (*Harima*) *callipteris* Butler.
23 and *24*, dorsal aspect of segments; *25*, head; *26*, larva; *27* and *28*, pupa; *29*, food plant.

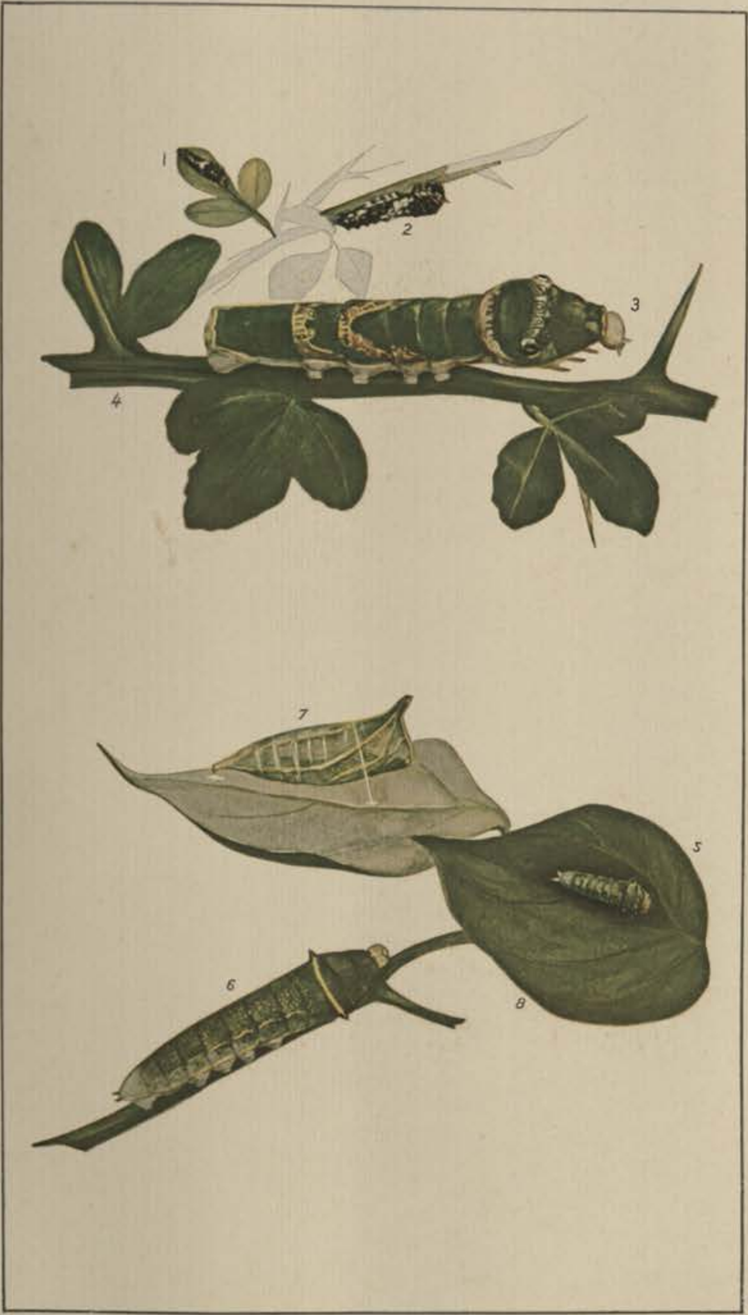


PLATE I. PAPILIO XUTHUS AND PAPILIO SARPEDON.

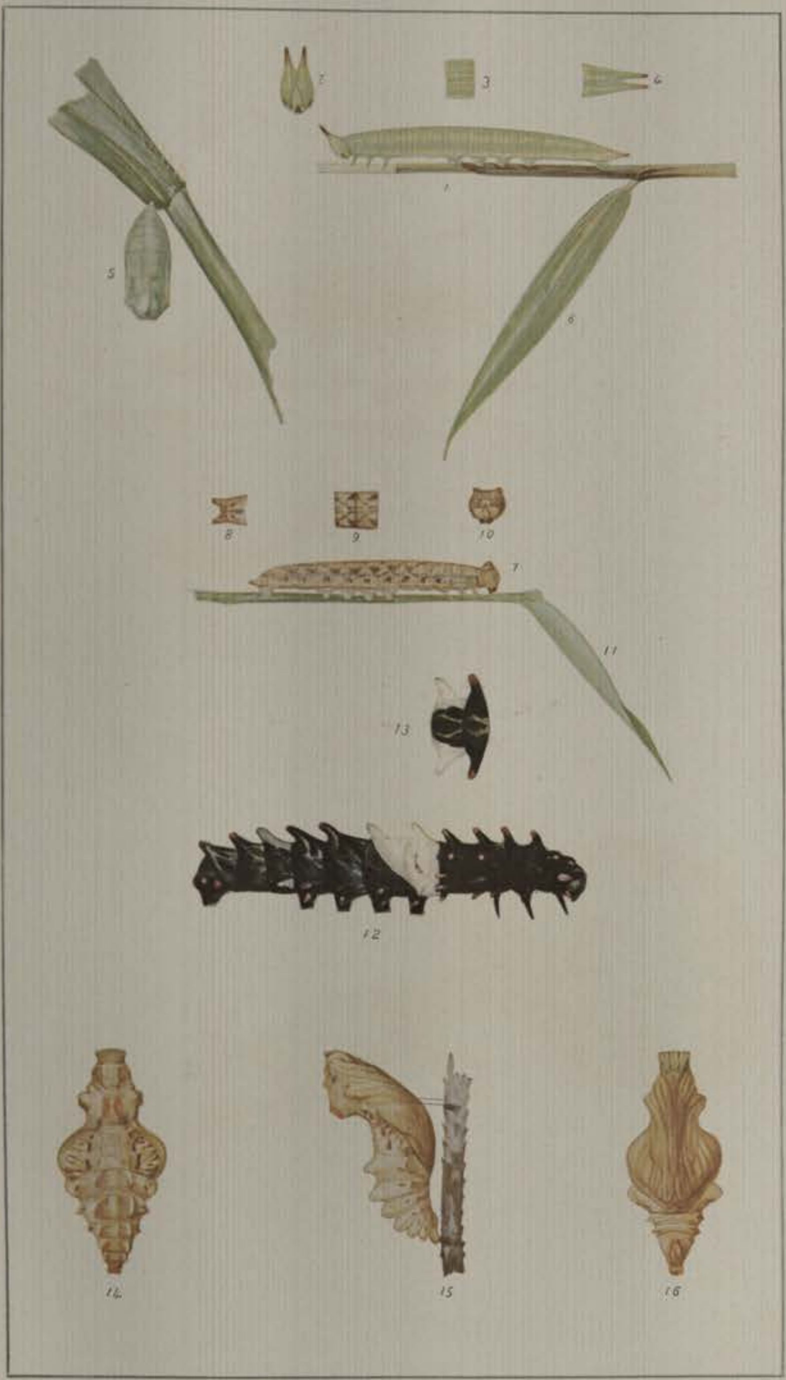


PLATE II. LETHE SICELIS, NEOPE GOSCHKEVITSCHII, AND PAPILIO ALCINOUS.

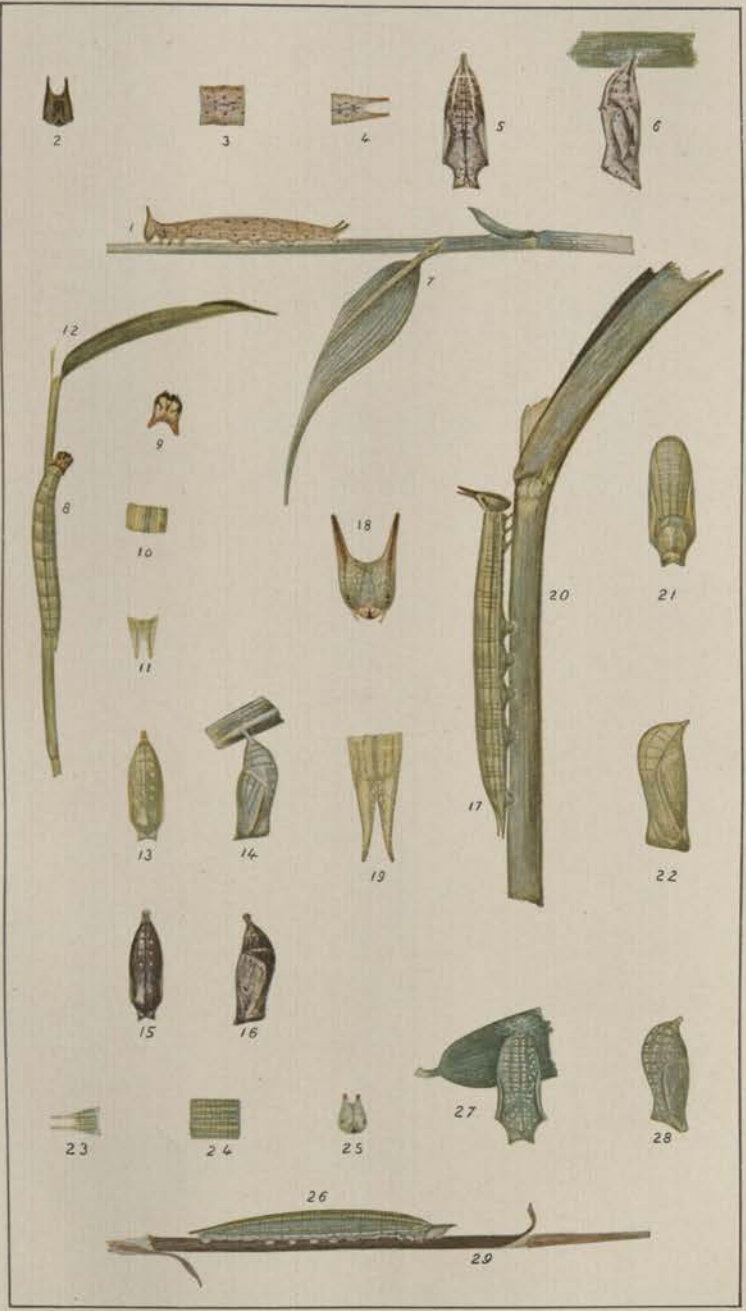


PLATE III. LETHE DIANA, L. MARGINALIS, L. CALLIPTERIS, AND SADARGA GOTAMA.

NEUE FULGORIDEN VON DEN PHILIPPINEN: I. THEIL

Von L. MELICHAR

(*Brünn, Moravia*)

Eine Tafel

CIXIINÆ

Benna sinuata sp. nov. (Fig. 1.)

Diese Art ist durch die etwas abweichende Form der Flügeldecken gekennzeichnet. Die Flügeldecken sind wie bei allen *Benna*-Arten nach hinten verbreitert. Der Apikalrand ist jedoch nicht schräg gerundet, sondern deutlich konkav, so dass die abgerundete Suturalecke stärker hervortritt da auch der innere Apikalrand schwach gebuchtet ist. Die Apikalecke ist breit abgerundet. Im übrigen treffen alle charakteristischen Merkmale dieser Gattung zu. Der Kopf, Thorax, die Unterseite und Beine blassgelb oder wachsgelb. Die Flügeldecken schmutzig milchweiss zur Spitze und zum Schlussrand leicht gelblich. Die Adern sind gelblichweiss, zart, nur in der Mitte der Flügeldecken und im Apikalteile braun, in den Endzellen am Apikalrande (mit Ausnahme der zweiten Apikalzelle) je ein brauner Längsstrich, zusammen 6 an der Zahl. Die stielartigen Fortsätze zu beiden Seiten des Körpers blassgelb, die erweiterte Spitze schwarz, mit aufliegendem weissen Sekret. Die Apikalrandader schwarz.

Länge ♂ 6.5 mm.

LUZON, Laguna, Mount Maquiling (1 Exemplar *Baker*).

DERBINÆ

Syntames tubulifer sp. nov. (Fig. 2.)

Scheitel breiter als lang, von der Stirne nicht abgetrennt, die Ränder gekielt, in der Mitte ein Kiel, welcher sich auf die Stirne fortsetzt. Stirne länglich, nicht schmal, die Seiten schwach nach aussen gebogen und gekielt. Fühler kurz, jedoch von oben sichtbar, das zweite Fühlerglied doppelt so lang wie breit, etwas keulenförmig. Subantennalplatte fehlt. Clypeus länglich dreieckig, in der Mitte schwach gekielt. Pronotum länger als der Scheitel, vorne schwach gerundet, hinten flach gebuchtet, mit 3 scharfen Kielen, die Seitenkiele stark nach aussen konkav, die Hinterecken des Pronotums erreichend. Schildchen breit, stark gewölbt, mit 3 parallelen Längskielen, die Seitenkiele dem

Mittelkiel genähert. Flügeldecken mehr als doppelt so lang wie einzeln breit, der äussere Sektor nahe der Basis gegabelt (Subcosta und Radia nach Kirkaldy), der zweite Sektor in der Mitte der Flügeldecken, der innere ungefähr hinter der Mitte der Clavusnaht gegabelt. Im Clavus eine gegabelte Ader, der Costalrand ist hinter der Mitte eine kurze Strecke fein quergestrichelt. Hinterschienen mit einem sehr kleinen Dorne hinter der Mitte. Ein ganz besonderes Merkmal für diese Art sind auf jeder Seite des Bauches befindliche zwei Röhren welche wahrscheinlich Trachealröhren sind. Die erste längere Röhre befindet sich an der Grenze zwischen der Hinterbrust und des basalen Ventralsegmentes, und hat zwei Öffnungen, eine grössere vorne, eine kleinere hinten, die zweite kürzere Röhre befindet sich in der hinteren Seitenecke des 1. Ventralsegmentes und hat nur eine Öffnung; die Basis der Röhrchen ist schwarz, die Spitze gelb.

Der ganze Körper ist schwarz, glänzend, bloss die Bauchlappen des Pronotums, das 2. Fühlerglied, mit Ausnahme der schwarzen Basis, die Mittel- und Hinterbrust und die Beine schmutzig blassgelb. Im Apikalteile der Flügeldecken 13 Randmakeln (Spitzen der Endadern) am Aussenrande und eine Makel am Innenrande schmutzig weiss. Die Schenkel etwas bräunlich, das Basalglied der Hintertarsen halb so lang wie die Hinterschiene, in der Mitte bräunlich.

Länge ♂ ♀ 4 mm.

LUZON, Laguna, Mount Maquiling (2 Exemplare *Baker*).

Vekunta lineata sp. nov.

Blassgelblich, die Augen, eine Mackel in der Mitte des Clypeus, eine Längsbinde nahe dem Costalrande, der Schlussrand, eine Mackel auf den Seiten der Vorderbrust und die Ränder der Deckschuppen schwarz. Der Scheitel ist so breit wie an der Basis, nach vorne etwas verschmälert, die gehobenen Seitenränder mit Körnchen dicht besetzt. Der Scheitel bildet mit der Stirne eine Ecke, die Stirne lang, schmal, zum Clypeus etwas verbreitert, in der Mitte nicht gekielt. Fühler kurz, das 2. Fühlerglied ziemlich gross, globulös. Subantennalplatte fehlt. Die Kiele des Pro- und Mesonotums sehr undeutlich. Flügeldecken länglich schmal, die Adern gelblichweiss, am Costalrande feine Körnchen und zu beiden Seiten des äusseren Clavusader eine Reihe solcher jedoch stärkerer Körnchen. Der Apikalteil leicht rauchbraun. Unterseite und Beine blassgelblich.

Länge ♂ 5 mm., ♀ 6 mm.

LUZON, Laguna, Mount Maquiling (2 Exemplare *Baker*).

Megatropis interruptolineata sp. nov.

Strohgelb, glänzend, Flügeldecken mit 3 schwarzen Längsstrichen und zwar: ein Strich an der Basis des Clavus in der Nahtzelle, der zweite tiefer hinten in der Mitte der Suturalzelle des Coriums und der dritte in der Mitte des Coriums zwischen dem mittleren und inneren Sektor. Im Apikalteile 4 querliegende Zellen. Die Stirne von der Seite betrachtet gerundet, mit dem gerundeten and gehobenen Scheitelrande eine leichte Einkerbung bildend, so dass die Abrundung keine vollständige ist. Die Augen halbmondförmig, die Fühler tief unten eingelenkt, das 2. Fühlerglied reicht bis zum vorderen Augenrande, ist cylindrisch, an der Spitze eingekerbt, die Fühlerborste distal eingefügt. Der obere Scheitelrand ist mit feinen Körnchen (sensible Organe) besetzt.

Länge 8 mm.

LUZON, Laguna, Los Baños (*Baker*).

Megatropis obliquefasciata sp. nov. (Fig. 3.)

Weiss, Stirne von der Seite betrachtet parabolisch vorgezogen, der Scheitelrand hinten gerundet, nach vorne fast horizontal in die Wölbung der Stirne übergehend, die Breite der Stirne vor den Augen beträgt gut den dreifachen Längsdurchmesser des Auges. Vor dem Auge eine rötliche Querbinde. Augen schwarz. Fühler lang, cylindrisch, bis über die Mitte der Wangen reichend, cylindrisch zur Spitze verschmälert, an der Spitze rötlich, eingekerbt, Fühlerborste distal. Die Basis des zweiten Fühlergliedes ist in einen gleich dicken Fortsatz nach hinten verlängert, welcher ungefähr ¼ der Länge des 2. Fühlergliedes beträgt. Fühlerdecken hyalin, milchweiss, mit weissen Adern und einer braunen schrägen Querbinde, welche von der Clavusspitze schräg nach hinten und aussen zum Costalrande zieht. Im Apikalteile 4 querliegende Zellen. Die Apikalzellen am Innenrande bräunlich gesäumt. Flügel hyalin, mit weissen Adern. Körper und Beine blass gelblichweiss.

Länge sammt Flügeldecke 8–9 mm.

LUZON, Laguna, Mount Maquiling (*Baker*).

Leptaleocera bakeri sp. nov.

Lang gestreckt, scharlachrot, die Augen, die Deckschuppen, eine von der Basis bis zum Apikalrande reichende Längsbinde in der Mitte der Flügeldecken und der schmale innere Rand des Apikalteiles hinter der Clavusspitze schwarz. Der Scheitel und die Stirne bilden von der Seite betrachtet einen zusammenhängenden Bogen. Die Wangen kaum so breit wie der Querdurchmesser des Auges. Das Auge hat die für die Gattung charakteristische Form, in dem das vordere Ende des Auges sich verschmälert und mit dem Stirnrande parallel und bogenförmig bis zur unteren Wangenecke herabreicht. Die Fühler sind bei diesem Exemplare leider abgebrochen. Unterseite und Beine scharlachrot, die Schienen mehr gelblich. Diese schöne Cicade ist nach der Färbung und Zeichnung, der eigentümlichen Form der Augen leicht zu erkennen.

Läng ♂ samt Flügeldecke 5 mm.

LUZON, Laguna, Mount Maquiling (1 Exemplar *Baker*).

Genus **DENDROKARA** novum

Eine durch die Form der Fühleranhängsel an die Gattung *Devandanda* Dist. erinnernde Gattung. Der Körper ist länglich, schmal. Der Scheitel mit der Stirne von der Seite betrachtet gerundet. Scheitel dreieckig, ziemlich breit, in der Mitte nicht gekielt. Augen klein, länglich oval. Clypeus kürzer als die Stirne, gewölbt, in der Mitte nicht gekielt. Die Fühler sind in der unteren Wangenecke eingelenkt, das Basalglied länglich, flach, an die Wangen angelegt, das 2. Fühlerglied kurz, oval oder länglich oval, mit dem ersten Gliede einen rechten Winkel bildend, nach aussen gerichtet, an der Basis mit kurzen oder langen, oft moosartig verzweigten Appendices. Pronotum schmal, in der Mitte deutlich gekielt. Schildchen stark gewölbt, mit 3 Kielen, die Seitenkiele nach aussen konkav, dem Mittelkiel genähert. Flügeldecken lang, schmal, hinten schräg abgerundet, der innere Apikalrand hinter der Clavusspitze etwas vorgewölbt. Das Geäder ist aus der Abbildung ersichtlich. Flügel etwas kürzer als die Flügeldecke, aber immer mehr als Zweidrittel der ganzen Länge. Beine grazil, Hinterschienen ohne Dornen.

Typ. gen.: *Dendrokara monstrosa* sp. nov.

Dendrokara monstrosa sp. nov. (Fig. 4.)

Die Stirne bildet mit dem Scheitel (von der Seite betrachtet) keinen einfachen Bogen, sondern der Scheitel ist höher gewölbt und bildet mit dem Stirnbogen eine seichte Einkerbung. Der Scheitel und die Wangen mit Ausnahme einer kleinen zentralen Partie schwarz. Pronotum auf der Scheibe pechbraun, an den Seiten gelb. An der Basis des 2. Fühlergliedes sind 3–4 lange, moosartig geformte schwarze Anhängsel verschiedener Länge. Das 2. Glied selbst ist länglich oval, schwarz, mit feinen weissen Wärzchen besetzt, die Spitze mit einem roten Punkt, die kurze Fühlerborste etwas distal gestellt. Schildchen schwarz, die Spitze breit gelb. Flügeldecken pechbraun, in der Mitte breit gelb, und eine grosse gelbe Mackel am inneren Apikalrande hinter der Clavusspitze. Brust und Beine gelb, Hinterleib pechbraun. Diese Art ist sofort nach den eigentümlichen Anhängseln der Fühler zu erkennen. Die Stirnbildung erinnert an die Gattung *Megalropis*, aber die Augen sind nicht halbmondförmig, sondern rund, die Fühler ganz abweichend.

Länge ♂ 7 mm.

LUZON, Laguna, Los Baños (1 Exemplar *Baker*).

Dendrokara torva sp. nov. (Fig. 5.)

Von derselben Form und Grösse, aber der Scheitel (von der Seite betrachtet) bildet mit der Stirne einen gleichmässigen Bogen. Das 2. Fühlerglied ist globulös mit eingeschnürrter Basis, aus welcher zwei kurze schwammartig geformte Blätter entspringen, welche das Fühlerglied schalenförmig fast einschliessen. Der Wangenrand und die ganze Oberseite des Körpers braun, glänzend, die Unterseite samt Beine gelb, der Hinterleibsrücken pechbraun. Die Form und das Geäder der Flügeldecken genau wie bei *monstrosa*. Diese Art ist durch die Fühlerbildung genügend gekennzeichnet.

Länge ♂ 7 mm.

LUZON, Laguna, Los Baños (1 Exemplar *Baker*).

DELPHACINÆ

Tropidocephala philippina sp. nov.

Weib. Scheitel so lang wie das Pronotum, nach vorne verschmälert und leicht nach unten gebogen, sowie Pronotum und Schildchen grünlichgelb oder schmutzig gelb, ohne Zeichnung. Stirne blass grünlichgelb, am unteren Ende des Mittelkieles ein brauner Fleck. Clypeus schwarzbraun, Fühler gelb, am 2. Fühlergliede ein schräger schwarzer Strich, die Wangen unterhalb der Fühler schwarz, Flügeldecken hyalin, mit blassgelblichen fein granulierten Adern, am Ende des mittleren Sektors ein schwarzer glänzender Höcker, der Clavus grünlichgelb, im Apikalteile zum inneren Rande eine gelblichbraune Mackel, an den Spitzen der Endnerven schwarze Punkte (2–3), und ein kleiner Punkt hinter der Mitte des Schlussrandes. Unterseite und Beine grünlichgelb.

Männchen. Die kleineren Männchen ebenso gezeichnet, die dunkle Färbung breitet sich mehr aus und verdrängt die grünlichgelbe Färbung bis auf einen kleinen Saum am Schlussrande, im Apikalteile einige helle Randflecken. In der Mitte der Flügeldecken nur ein dunkler glänzender Höcker wie beim ♀.

Länge ♂ 2.5 mm., ♀ 3 mm.

LUZON, Laguna, Los Baños (*Baker*).

Genus BAMBUSARIA novum

Kopf samt Augen etwas schmäler als der Thorax. Scheitel nur wenig die Augen überragend, vorne gerundet, die Seiten nach vorne schwach konvergierend, gekielt, in der Mitte ein deutlicher starker Längskiel, welcher sich auf die Stirne fortsetzt. Stirne länglich, viereckig, die Seiten parallel, oben und unten (Clypeusnaht) gerade, die Seiten stark gekielt, der ebenso starke Mittelkiel auf den Clypeus verlängert, dessen Seiten sowie die Wangen ebenfalls gekielt sind. Augen halbkugelig, dicht am unteren Rande die Fühler eingelenkt; dieselben sind lang, das Basalglied etwas wenig länger als das 2. Fühlerglied, zusammengedrückt kanntig, das 2. Fühlerglied an der Basis oben mit einer glatten Platte versehen, der übrige Teil mit kleinen Wärzchen und Härchen bedeckt. Pronotum breit, hinten flach gebuchtet, mit 3 Kielen, die Seitenkiele nach vorne konvergierend. Schildchen breit, gewölbt, mit 3 Längskielen, die Seitenkiele dem Mittelkiel etwas genähert, daher nicht in der Fortsetzung der Pronotumkiele liegend, nach hinten schwach divergierend.

Männchen. Das Pygophor ist länglich oval, der Aussenrand etwas gewulstet, in der Mitte des unteren Randes etwas erhaben. Die Griffel gross, hornartig, aus breiter Basis zur Spitze verschmälert, nach aussen gebogen, mit der Spitze einander berührend.

Länge ♂ 4 mm., ♀ 5 mm.

LUZON, Laguna, Mount Maquiling (*Baker*).

Kommt auf Bambusrohr vor und ist demselben schädlich.

Typ. Gen.: *Bambusaria picta* sp. nov.

Bambusaria picta sp. nov. (Fig. 6.)

Bräunlichgelb. Die Stirne, Clypeus und Wangen schwarz, die Kiele weiss; Scheitel schwarz, die Kiele weiss, die schwarze Färbung des Scheitels verlängert sich auf das Pro- und Mesonotum, nach hinten zu beiden Seiten des hellen Mittelkieles eine Längsbinde bildend. Das Basalglied der Fühler ist schwarz liniert, die Kanten weiss. Die Platte auf der Oberseite des 2. Fühlergliedes weiss mit einem schwarzen Punkt. Flügeldecken hyalin, mit einer breiten braunen Querbinde in der Mitte und einer halbmondförmigen, 2–3 hyaline Randflecken einschliessende Marginalbinde, am inneren Apikalrande, an den Enden der beiden äusseren Endadern spitzdreieckige Mackeln, eine kleine Mackel an der Teilungsstelle des inneren Sektors und eine solche am Schlussrande vor der Clavusspitze. Die Sektoren sind hinter der Querbinde verdickt, pechbraun, daselbst mit feinen Körnchen besetzt. Flügel hyalin, mit pechbraunen Adern, die Vorderbrust braun, an den Seiten der Mittelbrust eine braune runde Makel, die Bauchsegmente an der Basis braun, die Ränder hellgelb. Sämtliche Schenkel schwarz längsliniert. Flügeldecken hyalin, hinten abgerundet, der äussere und innere Sektor hinter der Mitte gegabelt, die Gabeläste durch eine Queraderlinie untereinander verbunden, aus welcher 5 Endadern entspringen, die beiden äusseren nach aussen gebogen, die 3. gerade die 4. und 5. nach innen stark gekrümmt. Im Clavus eine Gabelader. Beine einfach; Hinterschienen mit 2 kleinen Dornen, der erste dicht an der Basis, der zweite hinter der Mitte. Der bewegliche Apikalsporn stark.

Genus **MALAXA** novum

Kopf samt Augen schmäler als der Thorax. Scheitel länglich, nach vorne etwas wenig verschmälert, die Augen nur wenig überragend, mit fast undeutlichen Kielen. Stirne sehr lang und schmal, parallelseitig, an den Rändern und in der Mitte, sowie die Wangen gekielt. Der Mittelkiel auf der Scheitelspitze ein sehr kleines seichtes Dreieck bildend. Augen halbkugelig. Fühler sehr lang, die Basis der Flügeldecken überragend, cylindrisch, dünn, das 2. Fühlerglied um $\frac{1}{4}$ länger als der Basalglied, die Borste sehr kurz. Pronotum breit, vorne gerade abgestutzt, mit 3 Kielen und 2 Grübchen zwischen denselben. Schildchen breiter als lang, mit 3 Längskielen. Flügeldecken hyalin, hinten stark zugespitzt, mit 3 Sektoren, welche aus einer länglichen Basalzelle entspringen. Die beiden äusseren Sektoren einfach, der innere Sektor gegabelt, 5 Endadern, die mittlere gegabelt, der äussere Gabelast in die Apikalspitze mündend. Im kurzen Clavus eine Gabelader. Beine sehr grazil, Hinterschienen mit einem sehr kleinen Dorn in der Mitte. Endsporn fast so lang wie das Basalglied der Hintertarsen, dünn, aalförmig.

Typ. gen.: *Malaxa acutipennis* sp. nov.

Malaxa acutipennis sp. nov. (Fig. 7.)

Kopf, Thorax und Unterseite samt Beine wachsgelblich. Flügeldecken hyalin mit zwei braunen Querbinden. Die erste Binde schmal, vor der Mitte, die zweite breitere auf der Queraderlinie, sämtliche Endadern braun gesäumt. Auf dem Hinterleibsrücken zwei breite Längsbinden. Die Schenkel vor der Spitze schwarz geringelt, die Spitzen der Schienen schwärzlich.

Länge ♀ ungefähr 3.5 mm.

LUZON, Laguna, Los Baños (1 Exemplar *Baker*).

ISSINÆ

Genus **AUGILINA** novum

Körper lang gestreckt. Kopf samt Augen schmäler als der Thorax, in einen dreieckigen nach oben gekrümmten kurzen Fortsatz verlängert. Die Seiten des Scheitels geschärft, nach vorne konvergierend, die Spitze dicht vor den Augen nach oben gebogen, die Scheitelfläche glatt, nicht gekielt oder mit einem schwachen Mittelkiel versehen. Stirne länglich, nach unten verbreitert, die Ränder geschärft gehoben, die Stirnfläche an der Basis vertieft, unten mehr oder weniger gewölbt, nicht gekielt. Clypeus länglich dreieckig, gewölbt, nicht gekielt. Rostrum bis zur Mittelbrust reichend, kurz, Augen gross, halbkugelig, stark vorgewölbt, die Fühler kurz, Fühlerborste lang. Ocellen vorhanden. Pronotum glockenförmig, an den Seiten gerundet, oben konvex, vorne schwach gerundet, hinten gerade auf der Scheibe 2 nach hinten divergierende und abgekürzte vorne zusammenstossende kurze Kiele, welche eine dreieckige Grube begrenzen. Schildchen stark gewölbt, breiter als lang, mit 3 parallelen schwachen Längsbinden. Flügeldecken sehr lang und schmal, die Hinterleibsspitze überragend, hinten abgerundet, am Aussenrande in der Mitte leicht gebuchtet. Drei lange Adern, von welchen die beiden äusseren sich nahe der Basis miteinander verbinden; die Sektoren bilden im hinteren Viertel der Flügeldecken durch Gabelung zwei pentagonale Zellen und eine innere viereckige Zelle, welche auf einer von der Clavusspitze nach aussen ziehenden geraden Querader aufsitzen. Aus der letzteren entspringen 5 Endadern, die 2. und 3. bilden eine Gabel und entspringen mit der 4. Ader aus einem Punkte. Der Apikalrand besitzt einen schmalen fein quergestrichelten Saum. Der Clavus sehr lang; die beiden Clavusadern nahe der Basis vereinigt, eine sehr kurze Gabel bildend, der Gabelschaft mündet vor der Clavusspitze in die Clavusnaht. Flügel wenig kürzer als die Flügeldecken, mit wenigen Längsadern, Hinterleib walzenförmig, lang gestreckt, nach hinten verengt. Beine sehr lang, grazil, insbesondere die Vorderschenkel und Schienen auffallend lang und dünn, Hinterschienen mit 1 Dorne hinter der Mitte. Basalglied der Hintertarsen lang.

Typ. gen.: *Augilina longipes* sp. nov.

Augilina longipes sp. nov. (Fig. 8.)

Kopf in einen kurzen dreieckigen, dicht vor den Augen nach oben gekrümmten Fortsatz verlängert. Der Scheitel und die

Stirne samt Clypeus schwarz, glänzend, die Seitenkiele des Scheitels und der Stirne weiss. Pronotum weiss, die zwischen den Kielen liegende kleine dreieckige Grube schwarz. Die Seiten des Kopfes mit Ausnahme der Schläfen schwarz, glänzend, Fühler gelblich. Schildchen schwarz, glänzend, die Spitze blassgelblich, mit einem schwarzen Längsstrich. Flügeldecken hyalin, schwach milchig getrübt, an der Basis rötlich, mit einer breiten dunkelbraunen Querbinde auf der Querader und Teilungsstellen der Sektoren. Sämtliche Adern sind tief schwarz. Die Vorderbrust und die Vorderhüften schwarz, glänzend, die Mittel- und Hinterbrust blassgelb, auf der Seite eine grosse schwarze Mackel. Hinterleib blassgelb, eine breite Querbinde und die Spitze schwarz. Vorder- und Mittelschenkel bräunlichgelb, an der Unterseite schwarz, die Schienen und Tarsen pechbraun, die Hinterbeine tief schwarz, die Hintertarsen weiss.

Länge ♂ 7.5 mm.; Breite 2 mm.

LUZON, Laguna, Los Baños (1 Exemplar *Baker*).

Genus **SYMPLANA** Kirby

Symplana KIRBY, Journ. Linn. Soc. Zool. (1891), 24, 136. MELICHAR, Hom.-Fauna Ceylon (1903), 19. DISTANT, Fauna Brit. Ind., Rhynch. (1906), 3, 254.

Kopf in einen dreieckigen nach oben gebogenen Fortsatz verlängert. Der Fortsatz ist von der Seite betrachtet spitzig, von oben betrachtet abgestumpft, fast quer gestutzt. Der Scheitel nach vorne verschmälert, die Seitenränder gehoben gekielt, so dass der Scheitel vertieft erscheint. Stirne lang schmal, mit 3 starken Kielen, welche sich auf der Stirnbasis miteinander verbinden. Clypeus länglich dreieckig, in der Mitte fein gekielt. Die Augen halbkugelig, Ocellen vorhanden, Fühler kurz, Fühlerborste lang, Rostrum kurz. Pronotum schmal, vorne schwach gerundet, hinten sehr schwach gebuchtet, fast gerade, ohne deutliche Kiele, hinter den Augen jederseits ein kleiner Höcker. Schildchen breiter als lang, mit zwei parallelen schwachen Seitenkielen, der Mittelkiel sehr undeutlich. Flügeldecken lang, schmal, hinten abgerundet, mit 3 einfachen Sektoren, die beiden äusseren an der Basis miteinander verbunden, die Sektoren bilden durch Gabelung hinter der Mitte eine viereckige und zwei pentagonale Zellen, welche auf einer geraden Querader aufsitzen, aus welcher 5 Endadern entspringen, die 2. und 3. bilden eine Gabel, der Gabelschaft mit der 4. Ader aus einem Punkte entspringend. Clavus sehr lang, die beiden Clavusadern nahe der Basis vereinigt, die Gabeläste länger als bei

Augilina, Flügel wenig kürzer als die Flügeldecken. Beine einfach, nicht auffallend lang, Hinterschienen mit einem Dorne hinter der Mitte.

Typ. gen.: *Symplana viridinervis* Kirby.

Kirby hat diese Gattung auf Grund eines auf Ceylon gefundenen Exemplares gegründet und stellte diese Gattung zu den Dictyophorinen, mit welchen sie eine grosse äussere Ähnlichkeit hat. Da ich diese Cikada nicht kannte, folgte ich in meiner Arbeit Hom. Fauna Ceylon der Angabe Kirby's. Distant sprach mit voller Berechtigung den Zweifel aus, dass diese Gattung eine Dictyophorinengattung sei. Das mir von Baker von den Philippinen eingesendete Exemplar ist ohne Zweifel die Kirby'sche *Symplana,* welche mit der philippinischen Gattung *Augilina* sehr verwandt ist. Die Form und die Bildung der Flügeldecken und das Geäder ist bei beiden vollkommen gleich, nur sind bei *Symplana* 3 Stirnkiele vorhanden, bei *Augilina* keine Kiele, die Beine sind bei *Augilina* auffallend lang, bei *Symplana* gewöhnlich lang. Zu den Dictyophorinen können beide Gattungen nicht gerechnet werden, weil dieselben keine Seitenrandkiele besitzen, der Hinterrand des Pronotums gerade ist und der Schaft der Clavusadern nicht in den Schlussrand mündet. Nach meiner Ansicht gehören beide Gattungen zu den Issinen und zwar in die Nähe der Gattung *Augila* Stål mit welcher sie eine gewisse Verwandschaft zeigen.

Symplana viridinervis Kirby. (Fig. 9.)

Symplana viridinervis KIRBY, Journ. Linn. Soc. Zool. (1891), 24, 136, Tafel VI, fig. 11; MELICHAR, Hom.-Fauna Ceylon (1903), 19; DISTANT, Fauna Brit. Ind., Rhynch. (1906), 3, 254.

Der ganze Körper blassgrün, mit einer orangegelben Längsbinde, welche von der Scheitelspitze über das Pro- und Mesonotum und den Schlussrand bis zur Clavusspitze zieht. Die Spitze der Dornen der Hinterschienen dunkel.

Länge 7–8 mm.

LUZON, Laguna, Mount Maquiling (*Baker*); Ceylon, Pundaloya (*Kirby*).

Eupilis rubrovenosa sp. nov.

Der *E. nigrinervis* Stål ähnlich, die Adern der Deckflügel sind lebhaft rotbraun. Scheitel quadratisch, mit zwei eingepressten schwarzen kommaförmigen Längsstrichen. Stirne länglich, nach oben schwach verengt, mit 3 schwachen Kielen, die äusseren nach aussen gebogen, auf der Basis mit dem Mittelkiel verbunden. Die Stirnbasis ist mit hellen flachen Körnchen besetzt, welche sich jederseits längs des Stirnseitenrandes bis ungefähr zur Mitte der Stirne herabziehen. Die Stirne braun, mit 4 helleren Flecken. Flügeldecken und das Geäder wie bei *E. nigrinervis*, die Flügeldecken fast hyalin, nicht gefärbt, höchstens zum Schlussrande hellbräunlich, die rotbraunen Adern stark vortretend. Flügel hyalin, mit pechbraunen Adern, die Unterseite und Beine bräunlichgelb, die Schenkel und Schienen an den Kanten dunkel.

Länge 11 mm.

LUZON, Laguna, Mount Maquiling (*Baker*).

Eupilis hyalinocosta sp. nov.

Von allen bekannten Arten sofort dadurch zu unterscheiden, dass die innere Hälfte der Flügeldecken rotbraun oder gelblichbraun, von helleren Adern durchsetzt ist, die äussere Hälfte samt Adern hyalin und graulichweiss ist. Ferner befindet sich stets auf den grünen Brustlappen des dunklen Pronotums ein grosser schwarzer Punkt. Auf der Basis der Stirne in den Stirndreiecken keine Körnchen, diese sind bloss am Seitenrande der Stirne bis zur Spitze sichtbar. Die Stirne ist nicht dunkel gezeichnet, die Unterseite und Beine schmutzig olivengrün oder graulichgelb. Auf dem quer viereckigem Scheitel nahe dem Hinterrande 2 schwarze eingestochene Punkte, sowie 2 Grübchen auf der Scheibe wie bei allen Arten.

Länge 10–12 mm.

LUZON, Los Baños, Mount Maquiling (*Baker*).

Hemisphaerius affinis sp. nov.

Körper oval, olivengrün. Die Stirne lederartig gerunzelt, grün. Der Clypeusspitze schwarz. Unterseite und Beine schmutzig graulichgelb, die Vorder- und Mittelschienen an der Spitze schwarz, die Hinterschenkel bräunlich. Dem *H. chlorophanus* Mel. durch die lederartig gerunzelte Stirne sehr nahe stehend, unterscheidet sich von dieser Art durch schwarze Clypeusspitze und die bloss an den Spitzen schwarzgeringelten Schienen der vorderen Beine.

Länge 5 mm.; Breite 3.5 mm.

LUZON, Laguna, Mount Maquiling (*Baker*).

Hemisphaerius triangularis sp. nov.

Von der Form und Grösse der *H. affinis*. Stirne hellgrün, schmal rot gerandet, mit einem roten Dreieck in der Mitte. Clypeus schwarz, Scheitel rot. Pro- und Mesonotum hellgrün, die Ränder des letzteren und ein kleines Basaldreieck rot. Flügeldecken fein lederartig gerunzelt, olivengrün, der Schlussrand von der Basis bis zur Mitte rot gerandet, daneben ein hellgrüner Längsstreifen, welcher nach aussen durch einen roten Streifen begrenzt ist. Die Costalrandader schwärzlich. Unterseite und Beine schmutzig graulichgelb, die Schenkel mit Ausnahme der Basis und der Spitze, 2 Ringe an den Vorder- und Mittelschienen schwarz. Hinterschenkel bräunlich.

Länge 5 mm.; Breite 3.5 mm.

LUZON, Laguna, Mount Maquiling (*Baker*).

Hemisphaerius rufus sp. nov.

Stirn lederartig gerunzelt wie bei *H. affinis*, wie die ganze Oberseite blutrot, Clypeus mit Ausnahme der Basis schwarz. Die Beine schmutzig gelb, bloss die Spitzen der Vorder- und Mittelschienen schwarz, die Hüften und die Hinterschenkel, letztere mit Ausnahme der Spitze schwarz. Bauch mit 2-3 dunklen Querstreifen in der Mitte. Von *affinis* durch die blutrote Färbung der Oberseite verschieden.

Länge 5 mm.: Breite 4 mm.

LUZON, Laguna, Mount Maquiling (*Baker*).

Genus **LAPITHASA** novum

Kopf stark nach vorne vorgezogen. Der Scheitel parallelseitig, der über die Augen vorragende Teil doppelt so lang wie der Basalteil bis zum vorderen Augenrande, die Schläfenecken winkelig vorspringend, von der Seite betrachtet abgerundet. Scheitelränder etwas geschärft gekielt, in der Mitte ein vollständiger Längskiel. Stirne sehr lang, vor dem Clypeus plötzlich verbreitert, indem die Seitenränder eine nach aussen abgerundete Ecke bilden, mit 3 Kielen auf der Stirnfläche, welche sich auf der Stirnbasis miteinander verbinden. Clypeus ein Drittel der Stirnlänge, an den Seiten nur in der Mitte gekielt. Rostrum, die Hinterhüften erreichend, das letzte Glied kurz. Fühler kurz, das 2. Fühlerglied nur wenig länger als breit. Ocellen vorhanden. Pronotum vorne schwach gerundet, hinten fast gerade, oben mit 3 Kielen, ein Seitenrandkiel. Schildchen mit 3 Längskielen, die seitlichen schwach nach vorne konvergierend. Flügeldecken doppelt so lang wie einzeln breit, die Seiten parallel, hinten breit abgerundet, die Apikalecke stärker abgerundet als die Suturalecke. Der 1. Sektor nahe der Basis, die beiden inneren Sektoren hinter der Mitte gegabelt. Die Costalmembrane an der Basis schmal, nach hinten verbreitert, quergeadert. Im Apikalteile zahlreiche dichte Apikaladern, welche durch zahlreiche Queradern untereinander verbunden sind. Ein dem Apikalrande genäherte Subapikallinie. Die beiden Clavusadern hinter der Mitte des Schlussrandes vereinigt. Die Vorder- und Mittelbeine zusammengedrückt, die Schenkel an der Unterkante, die Schienen an der Aussenkante mässig erweitert. Hinterschienen zur Spitze verbreitert mit 2 starken Dornen vor der Spitze, das Basalglied der Hintertarsen länglich.

Typ. gen: *Lapithasa bakeri* sp. nov.

Lapithasa bakeri sp. nov. (Fig. 10.)

Braun. Flügeldecken pechbraun, auf der inneren Hälfte mehr oder weniger gelblich, nur gebändert und gesprenkelt, am Costalrande hinter der Mitte eine grosse gelblichweisse hie und da braune quergesprenkelte Mackel, vor derselben am Costalrande zahlreiche kleine hyaline Fleckchen, nach hinten mehrere hyaline Querstriche und dreieckige Randmackeln, insbesondere ist am Apikalrande aussen und innen je eine Quermackel, dazwischen in der Mitte des Apikalrandes eine kleine dreieckige Mackel. Vor der Suturalecke ist auf dunklem Grunde ein kleiner schwarzer Punkt. Flügel rauchbraun, mit schwarzen Adern. Die Unterseite und Beine braun. Das letzte Glied der Schnabelscheide weiss.

Länge 12 mm.

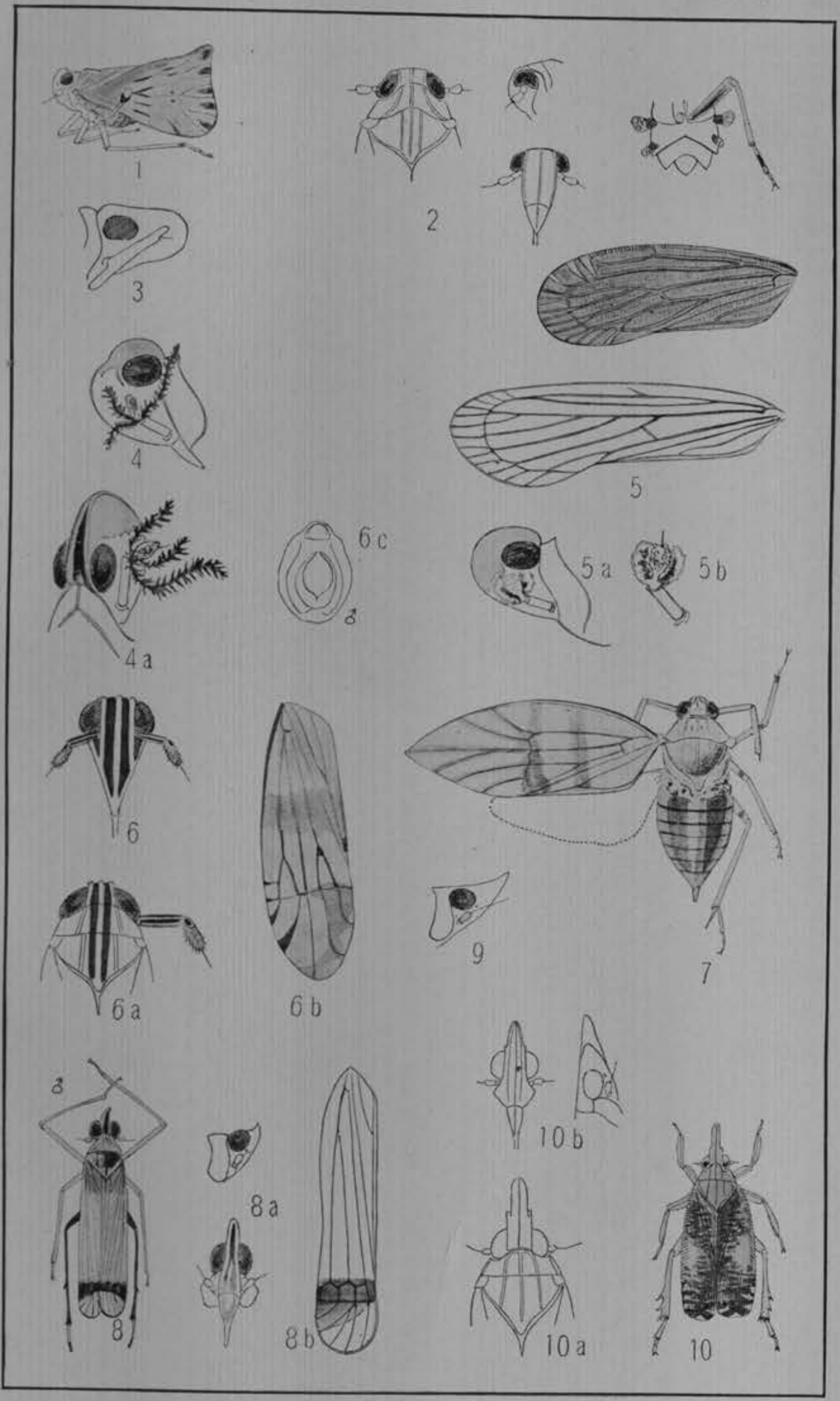
LUZON, Los Baños (*Baker*).

Über die systematische Stellung dieser Gattung bin ich nicht im Klaren. Nach dem äusseren Habitus würde man geneigt sein dieselbe zu den Lophopinen zu rechnen, aber dagegen spricht der Umstand, dass das Basalglied der Tarsen lang, nicht verdickt ist. Zu den Dictyophorinen kann diese Gattung aus dem Grunde nicht gerechnet werden, weil der Schaft der Clavusnerven in die Clavusspitze mündet und der Hinterrand des Pronotums gerade ist, nicht winkelig ausgeschnitten. Gegen die Einreihung in die Subf. Issinæ spricht der starke Seitenrandkiel auf dem Pronotum. Die Form der Stirne erinnert sehr an die von *Acarua* und *Kasserota* und würde vielleicht am ehestens in die Nähe der letztgenannten Gattung zu stellen sein, von welcher sich diese Gattung durch den langen Scheitel und die zusammengedrückten, etwas erweiterten Vorderbeine unterscheidet.

TAFELERKLÄRUNG

TAFEL I

FIG. 1. *Benna sinuata* sp. nov.
2. *Syntames tubulifer* Mel.
3. *Megatropis obliquefasciata* sp. nov.
4. *Dendrokara monstrosa* sp. nov.
5. *Dendrokara torva* gen. et sp. nov.
6. *Bambusaria picta* gen. et sp. nov.
7. *Malaxa acutipennis* gen. et sp. nov.
8. *Augilina longipes* gen. et sp. nov.
9. *Symplana viridinervis* Kirby.
10. *Lapithasa bakeri* gen. et sp. nov.



TAFEL I. NEUE FULGORIDEN VON DEN PHILIPPINEN.

ENUMÉRATION DES SERPHIDES (PROCTOTRUPIDES) DES ÎLES PHILIPPINES AVEC DESCRIPTION DE GENRES NOUVEAUX ET D'ESPÈCES NOUVELLES[1]

Par J. J. KIEFFER
(Bitsch, Germany)

Les premiers auteurs qui se sont occupés des *Serphides* ou *Proctotrupides* sont: Westwood, Ashmead, Brown et Crawford. Le nombre des espèces observées par eux est de 27. J'ai ajouté à ce chiffre 70 autres espèces, qui ont été recueillies à Los Baños, Luzon, par le professeur Ch. Fuller Baker. Ces 97 espèces, auxquelles viennent s'ajouter 24 nouvelles espèces, se répartissent de la façon suivante:

DRYINIDÆ

1. *Lestodryinus browni* Ashmead (*Dryinus*), Proc. U. S. Nat. Mus. (1905), **29**, 109. ♀.
2. *Lestodryinus luzonicus* Kieffer, Boll. Zool. Portici (1913), **7**, 189. ♀.
3. *Lestodryinus perkinsi* Kieffer, Bull. Soc. ent. France (1914), No. 1. ♀.
4. *Prodryinus* (?) *stantoni* Ashmead (*Dryinus*), Proc. U. S. Nat. Mus. (1904), **28**, 134. ♀.

BETHYLIDÆ

5. *Goniozus philippinensis* Ashmead, Proc. U. S. Nat. Mus. (1904), **28**, 134. ♀.
6. *Goniozus depressus* Kieffer, Insecta (1913), **3**, 318. ♀.
7. *Dissomphalus tibialis* Ashmead, Proc. U. S. Nat. Mus. (1904), **28**, 134. ♀.
8. *Misepyris exaratus* Kieffer, Insecta (1913), **3**, 317. ♀.
9. *Misepyris longiceps* Kieffer, Insecta (1913), **3**, 318. ♀.
10. *Rhabdepyris luzonicus* Kieffer, Boll. Zool. Portici (1913), **7**, 189. ♂.
11. *Epyris apertus* Kieffer, Boll. Zool. Portici (1913), **7**, 189.
12. *Epyris philippinensis* Kieffer, Insecta (1913), **3**, 258. ♂, ♀.
13. *Chlorepyris flavipennis* Kieffer, Boll. Zool. Portici (1913), **7**, 189.
14. *Neurepyris tagala* Ashmead (*Epyris*), Proc. U. S. Nat. Mus. (1905), **29**, 109. ♂.
15. *Xenepyris compressicornis* Kieffer, Insecta (1913), **3**, 259. ♂.
16. *Foenobethylus gracilis* Kieffer, Insecta (1913), **3**, 257. ♂.
17. *Cleistepyris minimus* Kieffer, Insecta (1913), **3**, 257. ♂.
18. *Cleistepyris minor* Kieffer, Insecta (1913), **3**, 256. ♂.
19. *Cleistepyris philippinensis* Kieffer, Insecta (1913), **3**, 254. ♂, ♀.

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[1] Since this paper was received, the author has sent descriptions of 1 more new genus and 4 more new species; namely, *Epyris filiformis*, genus *Uroscelio*, *Uroscelio luteipes*, *Dilapitha nitida*, and *Macroteleia flaviceps*. The descriptions of these species will be found under their respective genera, but the species are not included in the keys.—THE EDITORS.

SCELIONIDÆ

20. *Prosparasion cœruleum* Kieffer, Boll. Zool. Portici (1913), **7**, 190. ♂.
21. *Scelio philippinensis* Ashmead, Proc. U. S. Nat. Mus. (1905), **28**, 963. ♀.
22. *Scelio aratigena* Kieffer, Insecta (1913), **3**, 320. ♂, ♀.
23. *Scelio consobrinus* Kieffer, Insecta (1913), **3**, 319. ♂, ♀.
24. *Scelio variicornis* Kieffer, Insecta (1913), **3**, 319. ♂, ♀.
25. *Platyscelio abnormis* Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 126. ♂.
26. *Platyscelio punctatus* Kieffer, Insecta (1913), **3**, 321. ♂.
27. *Sparasion philippinense* Kieffer, Insecta (1913), **3**, 320. ♂, ♀.
28. *Calliscelio philippinensis* Kieffer, Insecta (1913), **3**, 322. ♂.
29. *Opisthacantha nigriclavata* Ashmead, Proc. U. S. Nat. Mus. (1905), **29**, 399. ♀.
30. *Macroteleia manilensis* Ashmead, Proc. U. S. Nat. Mus. (1905), **28**, 963, ♂; Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 127. ♀.
31. *Macroteleia crawfordi* Kieffer nom. nov. [*kiefferi* Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 127. ♀; non *kiefferi* Brues.]
32. *Macroteleia striativentris* Crawford, Proc. U. S Nat. Mus. (1910), **38**, 126. ♂, ♀.
33. *Macroteleia philippinensis* Kieffer, Insecta (1913), **3**, 323, 367. ♂, ♀.
34. *Hoploteleia pacifica* Ashmead, Proc. U. S. Nat. Mus. (1905), **29**, 112. ♀.
35. *Hoploteleia carinata* Kieffer, Insecta (1913), **3**, 368. ♀.
36. *Hoploteleia philippinensis* Kieffer, Insecta (1913), **3**, 369. ♂, ♀.
37. *Hoploteleia unidens* Kieffer, Insecta (1913), **3**, 370. ♂, ♀.
38. *Camptoteleia carinata* Kieffer, Insecta (1913), **3**, 387. ♀.
39. *Camptoteleia excavata* Kieffer, Insecta (1913), **3**, 388. ♂.
40. *Chrestoteleia bakeri* Kieffer, Insecta (1913), **3**, 389. ♂, ♀.
41. *Xenoteleia flavipennis* Kieffer, Insecta (1913), **3**, 390. ♀.
42. *Hadronotus flavipes* Ashmead, Proc. U. S. Nat. Mus. (1905), **29**, 399. ♀.
43. *Hadronotus philippinensis* Ashmead, Proc. U. S. Nat. Mus. (1904), **28**, 153. ♀.
44. *Anteris atriceps* Kieffer, Insecta (1913), **3**, 428. ♀.
45. *Habroteleia browni* Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 125. ♂.
46. *Neurocacus philippinensis* Kieffer, Insecta (1913), **3**, 429. ♂.
47. *Acolus luteipes* Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 124. ♀.
48. *Hoplogryon longispina* Kieffer, Insecta (1913), **3**, 429. ♂.
49. *Hoplogryon flaviclava* Kieffer, Boll. Zool. Portici (1913), **7**, 191. ♀.
50. *Hoplogryon roberti* Crawford (*Prosacantha*), Proc. U. S. Nat. Mus. (1910), **38**, 125. ♂.
51. *Hoplogryon striaticeps* Crawford (*Prosacantha*), Proc. U. S. Nat. Mus. (1910), **38**, 125. ♂.
52. *Telenomus catacanthæ* Ashmead, Canad. Ent. (1904), **36**, 284. ♂, ♀.

PLATYGASTERIDÆ

53. *Anopedias luzonicus* Ashmead, Proc. U. S. Nat. Mus. (1905), **28**, 964. ♀.
54. *Ceratopsilus rufipes* Kieffer, Insecta (1913), **3**, 461.

CERAPHRONIDÆ

55. *Ceraphron manilæ* Ashmead, Proc. U. S. Nat. Mus. (1904), **28**, 135. ♀.

DIAPRIIDÆ

56. *Galesus manilæ* Ashmead, Proc. U. S. Nat. Mus. (1905), **29**, 397. ♂, ♀.
57. *Galesus luzonicus* Ashmead, Proc. U. S. Nat. Mus. (1905), **29**, 398. ♂.
58. *Galesus clavaticornis* Kieffer, Insecta (1913), **3**, 430. ♀.
59. *Galesus philippinensis* Kieffer, Insecta (1913), **3**, 431. ♂.
60. *Galesus crawfordi* Kieffer, Insecta (1913), **3**, 432. ♂.
61. *Galesus curticeps* Kieffer, Insecta (1913), **3**, 432. ♂.
62. *Hemigalesus niger* Kieffer, Insecta (1913), **3**, 434. ♂, ♀.
63. *Hemigalesus rufus* Kieffer, Insecta (1913), **3**, 434. ♂, ♀.
64. *Hemigalesus brevicornis* Kieffer, Insecta (1913), **3**, 434. ♂.
65. *Hemigalesus gracilis* Kieffer, Insecta (1913), **3**, 435. ♂.
66. *Lipoglyptus primus* Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 122. ♂, ♀.
67. *Cologlyptus kiefferi* Crawford, Proc. U. S. Nat. Mus. (1910), **38**, 124. ♀.
68. *Scapopria atriceps* Kieffer, Insecta (1913), **3**, 441. ♀.
69. *Acidopria variicornis* Kieffer, Insecta (1913), **3**, 442. ♂, ♀.
70. *Acidopria tricornuta* Crawford (*Loxotropa*), Proc. U. S. Nat. Mus. (1910), **38**, 122. ♂, ♀.
71. *Acidopria monachanta* Kieffer, Boll. Zool. Portici (1913), **7**, 192. ♂.
72. *Acidopria tetratoma* Kieffer, Insecta (1913), **3**, 442. ♀.
73. *Phænopria rufa* Kieffer, Insecta (1913), **3**, 455. ♀.
74. *Phænopria nigriceps* Kieffer, Insecta (1913), **3**, 455. ♂.
75. *Phænopria exilis* Kieffer, Insecta (1913), **3**, 456. ♂.
76. *Loxotropa philippinensis* Kieffer, Insecta (1913), **3**, 456. ♂.
77. *Trichopria caudata* Kieffer, Insecta (1913), **3**, 456. ♀.
78. *Trichopria analis* Kieffer, Insecta (1913), **3**, 457. ♀.
79. *Trichopria semirufa* Kieffer, Insecta (1913) **3**, 457. ♂.
80. *Trichopria insulæ* Kieffer, Insecta (1913), **3**, 458. ♂.
81. *Ashmeadopria bakeri* Kieffer, Insecta (1913), **3**, 458. ♂,
82. *Ashmeadopria nigriventris* Kieffer, Insecta (1913), **3**, 459. ♂.
83. *Ashmeadopria bipunctata* Kieffer, Insecta (1913), **3**, 459. ♂.
84. *Aparamesius carinatus* Kieffer, Insecta (1913), **3**, 436. ♂, ♀.
85. *Aparamesius filicornis* Kieffer, Insecta (1913), **3**, 437. ♂.
86. *Aparamesius levistilus* Kieffer, Insecta (1913), **3**, 437. ♂.
87. *Aparamesius depressus* Kieffer, Insecta (1913), **3**, 437. ♀.
88. *Spilomicrus carinifrons* Kieffer, Insecta (1913), **3**, 438. ♂, ♀.
89. *Spilomicrus variicornis* Kieffer, Insecta (1913), **3**, 439. ♀.
90. *Spilomicrus opertus* Kieffer, Insecta (1913), **3**, 440. ♂.
91. *Spilomicrus dispansus* Kieffer, Insecta (1913), **3**, 440. ♂.
92. *Spilomicrus nitidicornis* Kieffer, Insecta (1913), **3**, 441. ♂.
93. *Spilomicrus consobrinus* Kieffer, Insecta (1913), **3**, 441. ♀.
94. *Loboscelidia rufescens* Westwood, Thesaur. entom. Oxon. (1874), 172.

BELYTIDÆ

95. *Aclista punctulata* Kieffer, Insect (1913), **3**, 459. ♂, ♀.
96. *Xenotoma philippinensis* Kieffer, Insecta (1913), **3**, 460. ♀.
97. *Procinetus rectinervis* Kieffer, Insecta (1913), **3**, 461. ♂.

DESCRIPTION DES NOUVELLES ESPÈCES ET DES NOUVEAUX GENRES

BETHYLIDÆ

Genus **GONIOZUS** Foerster

Parmi les 26 espèces dont se compose ce genre, les trois suivantes reviennent aux Philippines:

1. Segment médian marginé latéralement et postérieurement, ayant sur la moitié antérieure de sa partie médiane un espace proéminent, triangulaire et lisse .... G. triangulifer sp. nov.
   Segment non marginé, sans espace relevé et triangulaire .... 2.
2. Tête plane, circulaire, entièrement lisse .... G. depressus Kieffer.
   Tête allongée, parsemée de points .... G. philippinensis Ashm.

Goniozus triangulifer sp. nov. (♂, ♀.)

Noir, brillant, mandibules, antennes, genoux, tibias et tarses, parfois les quatre fémurs postérieurs d'un jaune clair. Tête presque circulaire, très faiblement chagrinée, parsemée de points peu profonds. Clypeus fortement caréné. Yeux deux fois aussi longs que leur distance du bord occipital. Ocelles postérieurs touchant le bord occipital, plus éloignés des yeux que l'un de l'autre. Articles antennaires 3–5 chez le mâle ou seulement le 3^{e} chez la femelle, un peu allongés, les suivants globuleux, sauf le 13^{e} qui est allongé. Thorax très finement chagriné. Pronotum de moitié plus long que le mesonotum, sillons parapsidaux nuls. Scutellum avec un mince sillon transversal. Segment médian marginé latéralement et postérieurement, mat et chagriné, ayant dans la moitié antérieure de sa partie médiane un espace relevé, triangulaire, lisse et brillant, à pointe dirigée en arrière et reliée au bord postérieur par une arête longitudinale. Ailes hyalines, prostigma, stigma et radius bruns, les autres nervures jaunes, radius presque droit, recourbé à l'extrémité, basale brisée fortement en angle, sa partie inférieure plus longue que la supérieure. Abdomen lisse et brillant, segment anal incurvé chez le mâle, droit et à tarière proéminente chez la femelle.

Taille: 2.5–3 mm.

Localités: LUZON, Laguna, Los Baños et Mont Maquiling, et Manila.

Genus **EPYRIS** Westwood

Epyris filiformis sp. nov. (♀.)

Noir, lisse, brillant, glabre; mandibules, 4 ou 5 premiers articles antennaires, palpes, tibias et tarses roux, reste des antennes graduellement assombri. Corps très mince. Tête quadrangulaire, au moins deux fois aussi longue que large, convexe, beaucoup plus large que le thorax, partie antérieure faiblement ponctuée, avec trace d'une ligne enfoncée longitudinale. Yeux glabres, allongés, grands, plus courts que l'occiput. Joues nulles. Front découpé en arc au bord antérieur. Clypeus situé plus bas que le front, fortement caréné. Mandibules médiocres, graduellement élargies, avec 3 ou 4 petites dents noires. Ocelle antérieur situé plus en arrière que le bord postérieur des yeux. Palpes courts, les maxillaires avec 3 petits articles après la flexion. Scape arqué, aussi long que les 3 ou 4 articles suivants réunis et guère plus gros, article 3ᵉ très transversal, les suivants un peu transversaux sauf le 13ᵉ, tous serrés. Thorax quatre à cinq fois aussi long que haut. Pronotum deux fois aussi long que large, trois fois aussi long que le mesonotum, sillons parapsidaux visibles seulement au tiers postérieur, élargis en virgule. Fossettes du scutellum séparées seulement par une arête. Segment médian horizontal, quadrangulaire et très long, deux fois et demie aussi long que large, densément strié en travers, marginé latéralement par deux arêtes séparées par une gouttière striée transversalement, bord postérieur non marginé, graduellement arrondi, mésopleures et métapleures densément ridées en long. Ailes subhyalines, atteignant le milieu de l'abdomen, souscostale confondue avec la postale, sauf distalement, basale oblique et distante du stigma de ses deux tiers, transversale perpendiculaire, stigma obconique, guère plus long que large, radius à peine arqué, deux fois aussi long que la basale, sans autres nervures. Fémurs très élargis, les antérieurs en ellipse, articles 2–4 du tarse antérieur cordiformes et aussi larges que longs, crochets tarsaux ayant au moins une dent. Abdomen aussi long que le reste du corps ou plus long, mince, graduellement en pointu, terminé par un stylet, comme d'ordinaire, tarière proéminente.

Taille: 6 mm. sur une largeur n'atteignant pas 1 mm.

Localité: LUZON, Laguna, Mont Maquiling.

SCELIONIDÆ

Genus **SCELIO** Latreille

Quatre espèces du genre *Scelio* étaient connues pour les Philippines; j'en ajoute deux nouvelles, qui se distinguent des précédentes d'après le tableau suivant.

1. Sillons parapsidaux plus ou moins distincts .... 2.
   Sillons parapsidaux nuls .... 3.
2. Tête et thorax avec des points serrés et ombiliqués, scape jaune brunâtre, joues non striées .... S. philippinensis Ashm.

coup plus large que le thorax, partie antérieure faiblement ponctuée, avec trace d'une ligne enfoncée longitudinale. Yeux glabres, allongés, grands, plus courts que l'occiput. Joues nulles. Front découpé en arc au bord antérieur. Clypeus situé plus bas que le front, fortement caréné. Mandibules médiocres, graduellement élargies, avec 3 ou 4 petites dents noires. Ocelle antérieur situé plus en arrière que le bord postérieur des yeux. Palpes courts, les maxillaires avec 3 petits articles après la flexion. Scape arqué, aussi long que les 3 ou 4 articles suivants réunis et guère plus gros, article 3e très transversal, les suivants un peu transversaux sauf le 13e, tous serrés. Thorax quatre à cinq fois aussi long que haut. Pronotum deux fois aussi long que large, trois fois aussi long que le mesonotum, sillons parapsidaux visibles seulement au tiers postérieur, élargis en virgule. Fossettes du scutellum séparées seulement par une arête. Segment médian horizontal, quadrangulaire et très long, deux fois et demie aussi long que large, densément strié en travers, marginé latéralement par deux arêtes séparées par une gouttière striée transversalement, bord postérieur non marginé, graduellement arrondi, mésopleures et métapleures densément ridées en long. Ailes subhyalines, atteignant le milieu de l'abdomen, sous-costale confondue avec la postale, sauf distalement, basale oblique et distante du stigma de ses deux tiers, transversale perpendiculaire, stigma obconique, guère plus long que large, radius à peine arqué, deux fois aussi long que la basale, sans autres nervures. Fémurs très élargis, les antérieurs en ellipse, articles 2–4 du tarse antérieur cordiformes et aussi larges que longs, crochets tarsaux ayant au moins une dent. Abdomen aussi long que le reste du corps ou plus long, mince, graduellement en pointu, terminé par un stylet, comme d'ordinaire, tarière proéminente.

Taille: 6 mm. sur une largeur n'atteignant pas 1 mm.

Localité: LUZON, Laguna, Mont Maquiling.

SCELIONIDÆ

Genus **SCELIO** Latreille

Quatre espèces du genre *Scelio* étaient connues pour les Philippines; j'en ajoute deux nouvelles, qui se distinguent des précédentes d'après le tableau suivant.

1. Sillons parapsidaux plus ou moins distincts........................ 2.
   Sillons parapsidaux nuls........................ 3.
2. Tête et thorax avec des points serrés et ombiliqués, scape jaune brunâtre, joues non striées........................ S. philippinensis Ashm.

Vertex et mesonotum lisses, avec de rares points non ombiliqués, scape noir, joues striées en partie........ S. bisectus sp. nov.

3. Joues striées........ 4.

Joues réticulées comme le reste de la tête........ 5.

4. Front strié jusqu'au milieu des yeux, hanches et massue des fémurs d'un brun noir........ S. aratigena Kieff.

Stries n'atteignant pas la base des yeux, hanches et pattes jaunes en entier........ S. luzonicus sp. nov.

5. Articles antennaires 3–5 rouges chez le mâle, scape de la femelle noir, hanches rousses........ S. variicornis Kieff.

Antennes noires en entier chez le mâle, scape de la femelle roux, hanches noires........ S. consobrinus Kieff.

Scelio bisectus sp. nov. (♂.)

Noir; antennes brunes, scape noir, mandibules d'un brun noir, les 2 lobes aigus et longs, pattes d'un jaune sâle, hanches noires, massue des quatre fémurs postérieurs brune, tarse postérieur brunâtre. Tête à ponctuation grosse et dense. Yeux réunis aux mandibules par un sillon. Bas du front strié de chaque côté, ces stries ne dépassent pas le sillon et n'atteignent pas ou à peine la base des yeux; fossette frontale remplacée par un petit espace lisse et brillant au-dessus du tubercule antennaire. Vertex brillant, lisse, à points épars et peu gros. Ocelles postérieurs distants des yeux de moins de leur diamètre. Article 3ᵉ des antennes obconique, plus gros et un peu plus long que le 2ᵉ, à peine plus long que gros, 4ᵉ obconique et transversal, 5ᵉ très gros, transversal, 6–10 également minces, serrés, très transversaux sauf le 10ᵉ, qui est ovoïdal. Thorax glabre. Pronotum ponctué densément. Mesonotum lisse, brillant, avec quelques rares points peu gros; sillons parapsidaux percurrents, profonds, divergents en avant, lobe médian du mesonotum plus large en arrière que les latéraux. Scutellum ponctué grossièrement en dé. Metanotum à arêtes longitudinales formant des fossettes, milieu en forme de tubercule peu apparent. Segment médian à grosses rides longitudinales. Pleures ridées en long et ponctuées, sans espace lisse. Ailes faiblement enfumées, sous-costale jaune, marginale circulaire, d'un brun noir, stigmatique d'un brun clair, presque perpendiculaire. Métatarse postérieur un peu plus long que les articles 2 et 3 réunis. Abdomen en ellipse allongé, déprimé, un peu dépassé par les ailes, arrondi en arrière, tous les tergites transversaux, striés en long avec le bord postérieur lisse, 6ᵉ et 7ᵉ seulement ponctués densément, les trois premiers graduellement plus longs.

Taille: 4.5 mm.

Localité: LUZON, Laguna, Los Baños.

Scelio luzonicus sp. nov. (♀.)

Noir; mandibules d'un brun noir, les 2 lobes aigus et peu longs, pattes jaunes, hanches plus sombres à la base. Tête à poils blancs, appliqués, courts, plus denses sur les tempes, grossièrement réticulée, sauf à la base du front qui est striée en long de chaque côté, ces stries ne dépassent pas le sillon qui réunit l'œil à la mandibule et n'atteignent pas ou à peine la base de l'œil. Fossette frontale comme chez le précédent. Antennes noires en entier, 3e article obconique, bien plus long que le 2e, deux fois aussi long que gros ou que le 3e. Thorax à poils plus rares que sur la tête, grossièrement réticulé, sans sillons parapsidaux, les pleures plutôt ridées-ponctuées. Ailes faiblement enfumées, subhyalines à la base, nervures très pâles. Abdomen comme chez le précédent sauf que le 6e ou dernier segment est chagriné, triangulaire, aussi long que large.

Taille: 6 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Genus **UROSCELIO** novum

♀. Yeux glabres. Mesonotum avec 2 sillons parapsidaux. Postmarginale plus longue que la stigmatique. Thorax inerme. Abdomen avec une corne, 6e segment subitement aminci et formant une longue queue. Le type est:

Uroscelio luteipes sp. nov. (♀.)

Noir; mandibules, antennes sauf les 5 derniers articles, hanches et pattes d'un jaune sâle, abdomen brun noir, marge latérale plus claire. Tête glabre, brillante, presque deux fois aussi large que longue vue d'en haut, beaucoup plus haute que longue vue de côté, un peu plus large que le thorax. Ocelles en triangle, les postérieurs distants des yeux de leur diamètre, beaucoup plus distants du bord postérieur que de l'antérieur. Joues lisses, égalant la moitié des yeux, avec une ponctuation assez grosse et assez dense et un profond sillon. Tempes larges, graduellement élargies par en bas, lisses, avec une ponctuation plus éparse que celle des joues. Vertex strié ou ridé densément en long. Front strié transversalement en arc, sans fossette, à peine déprimé au milieu. Antennes avec une massue de 6 articles, scape subcylindrique, un peu plus long que les articles 2 et 3 réunis, article 2e obconique, deux fois aussi long que gros, 3e égal au 4e, subcylindrique, presque double du 2e, 5e un peu plus court que le 4e et à peine plus gros, encore trois fois aussi long que gros, 6e un peu plus gros que le 5e, de moitié plus long que gros, 7e à peine plus long que gros, formant le commencement de la massue, plus gros que le 6^e mais moins gros que le 8^e, 7–11 presque transversaux et serrés, 12^e un peu allongé. Thorax peu convexe, mesonotum et scutellum mats, chagrinés, finement pubescents. Pronotum à peine visible d'en haut, mesonotum semicirculaire, sillons parapsidaux percurrents, peu divergents en avant, bord postérieur du lobe médian deux fois aussi large que les latéraux. Scutellum transversal, séparé du mesonotum par une rangée transversale de fossettes, bord postérieur marginé par des fossettes plus petites. Metanotum transversal, plus long que la moitié du scutellum, grossièrement cannelé en long, inerme. Segment médian découpé en trapèze jusqu'à sa base. Propleures avec un espace elliptique traversé par des arêtes longitudinales; mésopleures très excavées, lisses et brillantes. Ailes à peine teintées, pubescentes, ciliées, atteignant le milieu du 5^e tergite, sous-costale brune et située contre le bord, les autres nervures pâles, basale très oblique, marginale plus courte que la stigmatique, qui est oblique, longue, noueuse au bout, postmarginale plus de deux fois aussi longue que la stigmatique. Pattes grêles, tibia postérieur beaucoup plus long que le fémur, métatarse postérieur très long, deux fois aussi long que les 4 suivants réunis. Abdomen deux fois aussi long que le reste du corps, brillant; pétiole presque deux fois aussi long que large, linéaire, grossièrement cannelé, avec une corne obtuse striée transversalement en arc et s'engageant entre les deux lobes du segment médian, segments 2–5 formant un fuseau, le 2^e un peu plus long que le 1er, graduellement élargi, grossièrement cannelé en avant, finement strié dans le reste, de moitié plus long que large, 3^e à peine transversal, égalant les deux suivants réunis, finement ridé en long et ponctué, 4^e et 5^e très transversaux, le 4^e un peu plus long que le 5^e, tous deux densément ponctués, 6^e tergite subitement aminci, beaucoup plus étroit que le 5^e, formant une queue linéaire, déprimée, pubescente, presque aussi longue que les 3 tergites précédents réunis, côtés de l'abdomen faiblement pubescents.

Taille: 4.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Genus HOPLOTELEIA Ashmead

Hoploteleia carinata Kieff.

On ne connaissait de cette espèce que la femelle. Le mâle diffère par les antennes qui sont d'un jaune rougeâtre et assez grosses, 2ᵉ article très petit, 3ᵉ presque deux fois aussi long que le 2ᵉ, plus long que le 4ᵉ, 4–11 un peu plus gros que le 3ᵉ, à peine pus longs que gros, le 5ᵉ avec une minime dent latérale, 12ᵉ allongé. Tête seulement de moitié plus large que longue. Abdomen aussi long que le reste du corps, sculpté comme chez la femelle, sauf que le 3ᵉ tergite est ponctué densément, les suivants plus finement ponctués, le 7ᵉ très court, tronqué en arrière, avec une minime dent à chaque angle postérieur. Métatarse postérieur grossi. Pubescence du corps faible, peu apparente, jaunâtre.

Taille: 4 mm.

Localités: LUZON, Laguna, Los Baños, Mont Maquiling.

Genus **DILAPITHA** novum

Voisin de *Neuroteleia* Kieff., dont il diffère surtout par la présence des sillons parapsidaux. Le type est *D. albipes* sp. nov.

1. Thorax brun noir, brillant.. **D. nitida sp. nov.**
   Thorax roux mat, avec une bande longitudinale d'un brun noir. **D. albipes sp. nov.**

Dilapitha albipes sp. nov. (♂.)

Noir; thorax roux, lobe médian du mesonotum sauf l'extrémité antérieure, scutellum, metanotum et milieu du segment médian noirs, hanches postérieures et toutes les pattes blanchâtres, les hanches antérieures brunes, mandibules rousses, antennes d'un brun noir, scape blanc sâle, sauf l'extrémité. Tête presque deux fois aussi large que longue, densément striée ou ridée en travers sur le dessus. Yeux glabres, marginés au côté médian. Joues petites, striées, avec un sillon. Antennes grêles, filiformes, scape à peine plus gros que le flagellum, 2ᵉ article globuleux, 3–6 subégaux, cylindriques, trois fois aussi longs que gros, les suivants graduellement raccourcis, le 10ᵉ de moitié plus long que gros, flagellum pubescent. Thorax un peu plus long que haut. Pronotum non visible d'en haut. Mesonotum transversal, mat, très finement ponctué ou chagriné comme le scutellum, sillons parapsidaux percurrents, faiblement divergents en avant. Scutellum séparé du mesonotum par une ligne crénelée, arrondi en arrière. Metanotum armé de deux petites dents séparées par une incision arquée. Segment médian graduellement déclive. Ailes dépassant l'abdomen, pubescentes, ciliées, faiblement teintées, nervures pâles, sous-costale proche du bord, marginale très courte, stigmatique longue, oblique, deux fois aussi longue que la marginale, radius oblique, trois fois aussi long que la stigmatique, formant avec la postmarginale une longue cellule radiale fermée, basale arquée, formant avec la médiane une cellule basale fermée, deux autres nervures longitudinales parcourent la moitié distale de l'aile. Abdomen déprimé, à peine plus long que le reste du corps, arrondi en arrière, spatulé, pétiole à bords parallèles, à peine transversal, 2^e^ segment allongé, graduellement élargi, tous deux striés en long et avec des fossettes le long du bord antérieur, 3^e^ tergite transversal, à peine plus courte que le 2^e^, mat et ponctué densément comme les trois suivants.

Taille: 2.5 mm.

Localité: LUZON, Laguna, Los Baños.

Dilapitha nitida sp. nov. (♂.)

Noir; thorax brun noir, mandibules devant du scape et pattes d'un jaune sâlé, hanches d'un brun jaune. Tête aussi large que le thorax, très transversale, glabre, brillante, grossièrement striée en travers. Tempes étroites, lisses et finement ponctuées. Joues égalant le tiers des yeux, striées en éventail, une arête va de l'ocelle externe, le long du bord interne de l'œil, et traverse ensuite la joue jusqu'aux mandibules, entre les antennes se trouve une fine carène qui se prolonge encore en arrière. Front à peine déprimé, avec des stries arquées et transversales mais sans fossette. Yeux glabres. Ocelles postérieurs situés contre les yeux. Scape subcylindrique, un peu plus long que les deux suivants réunis, 2^e^ obconique, guère plus long que gros, 3–12 cylindriques, pubescents, graduellement raccourcis, le 3^e^ presque trois fois aussi long que gros, 11^e^ pas deux fois aussi long que gros, plus court que le 12^e^, le 5^e^ avec une petite dent avant le milieu. Thorax à peine plus long que haut, pronotum non visible d'en haut, mesonotum transversal, fortement convexe, brillant et très finement ponctué comme le scutellum, lobe médian un peu moins large en arrière que les latéraux, sillons parapsidaux convergents faiblement en arrière. Scutellum transversal, séparé du mesonotum par une rangée de fossettes, des fossettes semblables sont alignées le long de son bord postérieur. Metanotum petit, cannelé, les deux dents petites et rapprochées. Segment médian transversal. Propleures avec un espace elliptique bordé en avant de fossettes alignées, mésopleures bordées en arrière de fossettes alignées. Ailes un peu brunies, dépassant beaucoup l'abdomen, sous-costale distante du bord, basale oblique, distante de la marginale de sa longueur, marginale deux fois aussi longue que large, n'ayant que la moitié de la stigmatique qui est oblique et noueuse au bout, postmarginale deux à trois fois aussi longue que la stigmatique, radius oblique, atteignant le bord un peu en arrière de la postmarginale, récurrente, courte, continuant la direction du radius, anale percurrente. Abdomen déprimé, à peine plus long que le reste du corps, spatulé, pétiole un peu transversal, cannelé, à fossettes en avant, 2^e tergite graduellement élargi, un peu plus long que le 3^e, strié, avec des fossettes en avant, 3^e à peine plus court que les 3 suivants réunis, ponctué densément comme les suivants, tous les tergites transversaux.

Taille: ♂, 2.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Genus APEGUS Foerster

Apegus maquilingensis sp. nov. (♀.)

Noir mat; antennes et pattes sauf les hanches d'un jaune vitellin. Tête un peu transversale, à ponctuation éparse et superficielle. Yeux glabres. Ocelles postérieurs distants des yeux de moins de leur diamètre. Joues striées, séparées de la face par un sillon. Fosse frontale profonde, lisse, brillante, marginée, trois fois aussi large que sa distance du bord oculaire. Article 2^e des antennes à peine plus long que gros, 3^e deux fois aussi long que gros, obconique comme le 4^e, et un peu plus long que lui, 2–4 également minces, les suivants distinctement grossis, le 5^e obconique, un peu plus long que gros, 6–12 subglobuleux ou un peu transversaux et bien séparés. Thorax peu convexe, chagriné dorsalement. Sillons parapsidaux percurrents, divergents en avant. Scutellum séparé du mesonotum par un sillon, son bord postérieur arrondi et précédé de gros points alignés. Metanotum inerme. Ailes légèrement jaunâtres, nervures pâles, souscostale éloignée du bord, marginale petite, presque ponctiforme, stigmatique longue, oblique, noueuse au bout, postmarginale deux fois aussi longue que la stigmatique. Abdomen un peu plus long que le reste du corps, déprimé, presque d'égale largeur sauf aux deux extrémités qui sont un peu moins larges, les trois premiers tergites graduellement plus longs, 1er et 2^e striés, avec des fossettes le long du bord antérieur, transversaux, 3^e presque aussi long que large, mat et densément ponctué comme les suivants qui sont transversaux.

Taille: 3.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Genus **CAMPTOTELEIA** Kieffer

Les espèces dont se compose ce genre se répartissent de la façon suivante:

1. Front sans impression; metanotum à deux dents aiguës et se touchant presque à la base........ **C. carinata** Kieff.
   Front avec une profonde impression; metanotum avec une dent unique excavée dorsalement........ 2.
2. Dent du metanotum longue, égalant les deux tiers du scutellum. **C. magna** sp. nov.
   Dent du metanotum petite, large, un peu transversale........ 3.
3. Mesonotum et scutellum grossièrement ridés en travers. **C. flavipennis** sp. nov.
   Mesonotum et scutellum brillants et lisses, à points épars et fins........ 4.
4. Ailes brunes, abdomen aminci graduellement et fortement en arrière, 2e tergite réticulé, 3–7 striés, sans ponctuation........ **C. excavata** Kieff.
   Ailes subhyalines, abdomen faiblement aminci en arrière, tergites 2–7 grossièrement ponctués entre les arêtes........ **C. cupularis** sp. nov.

Camptoteleia magna sp. nov. (♀.)

Noir; mandibules jaunes, antennes sauf la massue, hanches et pattes d'un jaune sâle, tarse postérieur brun. Tête, vue d'en haut, subglobuleuse, à peine transversale, grossièrement ridée en travers, intervalles des rides formant des gros points ocellés. Yeux grands, glabres; ocelles en triangle, les postérieurs touchent les yeux. Vertex depuis l'ocelle postérieure jusqu'à l'excavation frontale formant un espace deux fois aussi long que large, à bords parallèles; bord postérieur du vertex marginé en arc comme le bord postérieur des yeux, puis déclive obliquement en arrière, cette partie oblique à gros points ocellés. Tempes graduellement et fortement élargies par en bas, leur bord postérieur aigu et marginé. Joues ayant le tiers de la longueur des yeux, avec un large sillon. Excavation frontale profonde, plus de quatre fois aussi large que sa distance du bord oculaire, lisse et brillant, sa partie supérieure striée en arc transversalement, son extrémité supérieure arquée et marginée. Antennes avec une massue de sept articles, scape aussi long que les trois articles suivants réunis, 2^{e} article deux fois aussi long que gros, 3^{e} de moitié plus long que le 2^{e}, 4^{e} plus court que le 2^{e}, 5^{e} un peu plus court que le 3^{e} et à peine plus gros, 6–12 subitement grossis et serrés, le 6^{e} moins gros que les suivants, qui sont un peu transversaux, sauf le dernier. Pronotum nul au milieu, le bord dorsal du prothorax étant formé par le col, situé plus bas que le mesonotum; celui-ci un peu allongé, brillant, pubescent, à points épars et fins, arête médiane traversant encore le scutellum, sillons parapsidaux divergents en arrière. Scutellum grand, atteignant presque la demi-longueur du mesonotum, arrondi en arrière et ponctué comme le mesonotum, bord postérieur relevé, tranchant et séparé du disque par un enfoncement en forme de gouttière, qui est traversé par de courtes arêtes longitudinales. Metanotum très court, parcouru par des arêtes, armée d'une dent horizontale, longue, atteignant les deux tiers du scutellum, graduellement amincie et profondément excavée dorsalement. Segment médian court, parcouru par des arêtes, divisé au milieu, jusqu'à sa base, en deux lobes. Pleures ridées en long, mésopleures très excavées, propleures avec un long espace elliptique marginé. Ailes jaunes, atteignant le segment anal, sous-costale éloignée du bord, marginale ponctiforme, postmarginale nulle, stigmatique oblique, longue, noueuse au bout. Abdomen un peu plus long que le reste du corps, aussi large que le thorax, graduellement aminci en arrière, composé de 6 segments transversaux, sauf le 6ᵉ qui est triangulaire, et aussi long que large, les trois premiers graduellement plus longs, striés en long comme les autres.

Taille: ♀, 6 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Camptoteleia flavipennis sp. nov. (♂.)

Noir; scape, hanches et pattes jaunes. Tête sans arête transversale en arrière des ocelles, non déclive obliquement en arrière mais découpée en arc, grossièrement ridée-ponctuée, vertex ridée en travers, joues à sillon, yeux non marginés, fossette frontale comme chez le précédent mais non striée. Antennes filiformes; scape un peu plus long que les articles 2 et 3 réunis, lisse et glabre comme le 2ᵉ, les suivants pubescents et mats, le 3ᵉ un peu plus long que le 2ᵉ, 4–11 cylindriques, aussi longs que le 2ᵉ mais plus gros, à peine aussi longs que gros, le 5ᵉ avec une minime dent au milieu du bord externe, 12ᵉ plus long que le 11ᵉ. Thorax conformé comme chez le précédent, sauf la sculpture et la dent du metanotum; sa partie dorsale est grossièrement ridée en travers, la dent du metanotum est petite, large, un peu transversale, excavée dorsalement et cupuliforme. Ailes jaunes, atteignant le segment anal, nervures brunes, conformées comme chez le précédent. Abdomen à peine plus long que le reste du corps, graduellement et fortement aminci en arrière à partir du milieu, les deux derniers segments n'ayant pas la demi-largeur du second, le premier strié, les suivants grossièrement réticulés, 3ᵉ et 4ᵉ aussi longs que larges, les autres transversaux, 6e et 7e deux fois aussi larges que longs, sans appendices.

Taille: ♂, 3.8 mm.

Localité: LUZON, Laguna, Los Baños.

Camptoteleia cupularis sp. nov. (♂.)

Noir; scape, hanches et pattes d'un jaune pâle, antennes brunes, tarse postérieur assombri. Tête grossièrement ponctuée, les points non ocellés, vertex ridé en travers. Article 3e des antennes deux fois aussi long que le 2e, distinctement plus long que le 4e, 4–12 cylindriques, un peu allongés, subégaux sauf le 12e qui est plus long que le 9e. Mesonotum et scutellum brillants, à points épars et fins, dent du metanotum cupuliforme comme chez le précédent. Ailes subhyalines, nervures jaunes. Abdomen de moitié plus long que le reste du corps, tergites striés en long, 2–7 non lisses et brillants entre les arêtes mais grossièrement ponctués et mats, le 3e le plus long, faiblement allongé, 2e et 8e aussi long que larges, les autres transversaux, le 7e tronqué, avec une dent à peine perceptible à chaque angle postérieur.

Taille: ♂, 5.5 mm. Pour le reste, semblable au précédent.

Localité: LUZON, Laguna, Mont Maquiling.

Genus MACROTELEIA Westwood

Les représentants de ce genre dans les îles Philippines se distinguent comme il suit:

1. Scutellum muni, en arrière, de deux bouquets de longs poils blancs, ligne dorsale du 6e tergite fortement arquée.................... **M. manilensis** Ashm.
   Scutellum sans bouquets de poils, ligne dorsale du 6e tergite droite........ 2.
2. Thorax densément pubescent dorsalement et mat; impression frontale très faible, mate et ponctuée sauf le centre, 7e tergite dépassant de moitié le 7e sternite.. **M. superans** sp. nov.
   Thorax presque glabre, impression frontale profonde, lisse et brillante.. 3.
3. Postmarginale guère plus longue que la marginale, 2e et 3e tergites de la ♀ d'égale longueur.... **M. crawfordi** Kieff. (**M. kiefferi** Crawf. non Brues).
   Postmarginale au moins deux fois aussi longue que la marginale........... 4.
4. Impression frontale moins large que sa distance des yeux, tête et mesonotum densément ponctués, 6e tergite de la ♀ comprimé et plus long que le 5e.. **M. striativentris** Crawf.
   Impression frontale au moins deux fois aussi large que sa distance des yeux, 6e tergite de la ♀ déprimé comme les autres, plus court que le 5e, tous deux transversaux.. 5.
5. Tête lisse, à ponctuation superficielle, éparse et peu distincte.
   M. philippinensis Kieff.
   Tête à points gros et serrés.................................... **M. cavifrons** sp. nov.

Macroteleia superans sp. nov. (♂.)

Noir, mat; scape, hanches et pattes d'un jaune clair, reste des antennes d'un jaune brunâtre. Tête de moitié plus large que longue, pubescente, ponctuée densément et assez finement, tempes ridées en long ou réticulées. Fossette frontale remplacée par une faible dépression non marginée, moins large que sa distance des yeux, mate et ponctuée, sauf un petit espace lisse au centre. Joues à sillon, mesurant le quart des yeux, ceux-ci glabres. Ocelles postérieurs distants de l'œil de leur diamètre. Scape un peu arqué, à peine plus court que les articles 2 et 3 réunis, 2^e^ un peu plus mince que les suivants, obconique, deux fois aussi long que gros, 3^e^ trois fois aussi long que gros, 4–11 cylindriques, allongés mais moins que le 2^e^, le 5^e^ avec une dent latérale, 12^e^ plus long que le 11^e^. Thorax dorsalement plus fortement pubescent de gris que la tête, de sorte que sa ponctuation, qui est plus fine que celle de la tête, est à peine perceptible. Pronotum aussi élevé que le mesonotum, profondément découpé au milieu et seulement ponctiforme à cet endroit. Mesonotum allongé, sillons parapsidaux percurrents, très divergents en avant. Ailes un peu jaunâtres, nervures jaunes, marginale aussi longue ou à peine plus longue que la stigmatique, postmarginale presque triple de la stigmatique, celle-ci oblique, longue, noueuse au bout. Segment médian glabre, ridé en long, tronqué postérieurement, sans incision et sans dents. Pleures subglabres, rugueuses, mésopleures cannelées supérieurement, enfoncées, lisses et brillantes dans la moitié inférieure. Métatarse plus de deux fois aussi long que le 2^e^ article, égalant les 3 suivants réunis. Abdomen presque deux fois aussi long que le reste du corps, fusiforme, les 7 tergites allongés, le 1^er^ d'un tiers plus long que large, 2^e^ un peu plus court que le 3^e^, qui est deux fois aussi long que large, 4^e^ à peine plus court que le 2^e^, plus long que le 1^er^, 5^e^ plus long que le 6^e^, un peu plus court que le 4^e^, 6^e^ égal au 1^er^, 7^e^ mince, en pointe triangulaire, un peu plus long que large; vu de côté le 7^e^ tergite dépasse de sa demi-longueur le 7^e^ sternite; les 4 premiers tergites sont striés en long, 5^e^ faiblement ridé en long, 6^e^ et 7^e^ mats et chagrinés, vus de côté, leur ligne dorsale est droite.

Taille: ♂, 6.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Macroteleia cavifrons sp. nov. (♀.)

Noir, brillant; scape, hanches et pattes d'un jaune sâle, tarse postérieur noir. Tête presque deux fois aussi large que longue, avec des points gros et denses, sauf dans la fossette du front, qui est profonde, lisse, et atteignant presque les yeux. Joues très petites, avec un sillon. Ocelles en triangle, les postérieurs sont distants des yeux de moins de leur diamètre. Thorax conformé comme chez le précédent, sauf la sculpture; mesonotum presque lisse, avec une ponctuation très fine et peu distincte, bord antérieur à gros points alignés, sillons parapsidaux divergents en avant. Scutellum transversal, presque lisse. Metanotum grossièrement sculpté, égalant le tiers du scutellum. Segment médian petit, découpé, les angles en forme de petite dent. Propleures avec l'espace elliptique ordinaire. Ailes hyalines, marginale égalant la stigmatique, atteignant le tiers de la postmarginale, stigmatique oblique, longue, avec un nœud au bout. Métatarse postérieur égalant au moins les 4 articles suivants réunis. Abdomen à peine deux fois aussi long que le reste du corps, fusiforme, les 5 premiers tergites grossièrement striés en long, 6^e et 7^e chagrinés et mats, tous déprimés, le 1^{er} un peu allongé, plus court que le 2^e, 2–4 subégaux, au moins aussi longs que larges, 5^e et 6^e à peine transversaux, 7^e très petit.

Taille: ♀, 6 mm.

Localité: LUZON, Laguna, Los Baños.

Macroteleia flaviceps sp. nov. (♂.)

Noir; tête jaune et mate, alentours des ocelles assombris, scape, hanches, pattes et thorax sauf le dessus d'un jaune mat, milieu des tergites 2–4 et des sternites 2–4 d'un jaune roussâtre, flagellum brun. Tête découpée en arc postérieurement, grosse, un peu transversale, lisse ou à peine chagrinée. Tempes très larges, aussi larges que les yeux. Joues égalant les deux tiers des yeux, traversées par un sillon. Ocelles postérieurs touchant presque les yeux. Scape aussi long que les trois articles suivants réunis, articles 2 et 3 obconiques, au moins de moitié plus longs que gros, 4–11 égaux, cylindriques, à peine plus longs que gros, le 5^e un peu grossi, le 4^e un peu plus court que le 6^e, 12^e faiblement allongé. Mesonotum plan, allongé, mat, pubescent, avec une ponctuation médiocre et dense, sillons parapsidaux percurrents, fortement convergents en arrière. Scutellum transversal, sculpté comme le mesonotum, tronqué en arrière, bordé postérieurement par des fossettes. Metanotum à peine visible. Segment médian horizontal, transversal, tronqué en arrière. Ailes subhyalines, atteignant le milieu du 4^e tergite, sous-costale éloignée du bord, marginale plus longue que la stigmatique, celle-ci oblique, médiocrement longue, noueuse au bout, postmarginale presque triple de la stigmatique, basale nulle. Métatarse postérieur un peu plus court que les 4 articles suivants réunis. Abdomen deux fois et demie aussi long que le reste du corps, plus étroit que le thorax, presque linéaire, sauf que les 3 derniers segments sont un peu plus étroits, tous allongés, 1–3 graduellement plus longs, le 3e deux fois aussi long que large, tous trois striés, leurs bords latéraux avec une arête marginale plus forte, 4e égal au 2e, 5–7 graduellement raccourcis, ridés en long ou finement chagrinés et pubescents.

Taille: 4.5 mm.

Localité: LUZON; Laguna, Mont Maquiling.

DIAPRIIDÆ

Genus PARAMESIUS Westwood

Paramesius luzonicus sp. nov. (♂.)

Noir, lisse et brillant; flagellum roux brun, mat et pubescent, mandibules, hanches et pattes d'un roux sombre, palpes blanchâtres. Tête un peu transversale vue d'en haut, plus haute que longue vue de côte, sans ponctuation. Yeux glabres. Joues sans sillon. Palpes maxillaires ayant après la flexion 3 articles dont le 1er est très petit, le 2e comprimé et triangulaire, tous deux réunis aussi longs que celui qui précède la flexion, le dernier un peu plus long que l'avant-dernier. Antennes aussi longues que le corps, scape cylindrique, égalant le 3e article, le 2e glabre, brillant, globuleux, mince comme les suivants, 3e quatre fois aussi long que le 2e, 3–13 graduellement amincis et raccourcis, le 12e plus de deux fois aussi long que gros, égal au 13e. Sillons parapsidaux percurrents, divergents en avant, lobe médian du mesonotum un peu plus large en arrière que les lobes latéraux, ceux-ci faiblement déprimés, avec une fossette allongée près du bord externe. Scutellum avec deux fossettes séparées par une arête. Segment median avec une dent pointue mais petite. Ailes faiblement brunies, dépassant un peu l'abdomen, brièvement ciliées, souscostale atteignant le milieu, marginale guère plus longue que large, stigmatique oblique, égale à la marginale, récurrente indiquée par une trace, basale indiquée par un trait à peine perceptible, arqué et distant de la marginale de moins de sa longueur. Thorax brièvement ovoïdal, guère plus long que haut. Tiers distal du tibia postérieur subitement grossi. Pétiole égalant la demi-longueur de l'abdomen, trois fois aussi long que gros, cannelé; abdomen en ellipse allongée, déprimé, graduellement aminci en avant jusqu'au pétiole, 2ᵉ tergite occupant les $\frac{4}{5}$, 2ᵉ sternite occupant les $\frac{3}{4}$ de l'abdomen.

Taille: 3.6 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Genus SPILOMICRUS Westwood

Ce genre comprenait 5 espèces dans les îles Philippines; nous y ajoutons une sixième.

1. Sillons parapsidaux percurrents .... 2.
   Sillons parapsidaux nuls ou marqués seulement en arrière, tête sans ponctuation .... 3.
2. Tempes et joues ponctuées .... S. carinifrons Kieff.
   Tête sans ponctuation .... S. philippinensis sp. nov.
3. Scutellum ayant, outre les 2 fossettes basales, une fossette latérale allongée et une rangée de points au bord postérieur .... 4.
   Scutellum sans fossettes latérales ni postérieures; sillons parapsidaux formant seulement un point allongé .... S. variicornis Kieff.
4. Yeux reliés aux mandibules par un sillon, sillons parapsidaux marqués au tiers postérieur .... S. opertus Kieff.
   Yeux non reliés aux mandibules par un sillon, les sillons parapsidaux forment seulement un point allongé au bord postérieur .... 5.
5. Flagellum roux brun, tergites ne couvrant pas les sternites. S. dispansus Kieff.
   Flagellum noir brillant et plus gros, tergites couvrant les sternites. S. nitidicornis Kieff.

Spilomicrus philippinensis sp. nov. (♂.)

Noir; flagellum brun noir, hanches et pattes d'un jaune brunâtre. Tête non ponctuée, lisse comme le reste du corps. Yeux velus. Antennes filiformes, 2ᵉ article globuleux, 3ᵉ plus court que le scape, presque trois fois aussi long que gros, 4ᵉ non échancré, 12ᵉ encore deux fois aussi long que gros, plus court que le 13ᵉ; pubescence fine. Sillons parapsidaux percurrents, fortement divergents en avant. Scutellum avec 2 fossettes basales séparées par une arête, fossettes latérales petites et minces. Segment médian avec une petite dent pointue. Ailes ciliées, sous-costale parallèle à la costale, dépassant un peu le tiers basal de l'aile, marginale pas plus longue que large, stigmatique oblique, un peu plus longue que la marginale, basale faiblement marquée, arquée. Pétiole presque deux fois aussi long que gros, strié; abdomen déprimé, en ellipse, relevé à sa base, dépassé de beaucoup par les ailes.

Taille: 2 mm.

Localité: LUZON, Laguna, Los Baños.

Genus **DIGALESUS** novum

Semblable à *Galesus*, dont il diffère par le scape non bispinuleux, par les antennes de 13 articles et les ailes pourvues d'une sous-costale, d'une marginale et d'une stigmatique. Le type est:

Digalesus flavipes sp. nov. (♂.)

Noir, lisse et brillant, flagellum brun sombre et pubescent, pattes jaunes, hanches assombries, moitié postérieure des tempes, devant du prothorax et métapleures, avec un feutrage blanchâtre. Tête allongée, presque droite dessus et dessous, déclive presque verticalement en avant, plus longue dorsalement que haute, ventralement encore plus longue et prolongée en un bec formé par les mandibules et atteignant le prosternum; vertex avec 2 arêtes longitudinales qui atteignent les ocelles, ceux-ci groupés en triangle, se touchant et situés au bord antérieur de la tête; une carène médiane descend de l'ocelle antérieur jusque entre les antennes en s'élevant graduellement, l'arête qui contourne le bord des yeux se prolonge en carène parallèle à la carène médiane et s'arrête brusquement en forme de dent, comme la médiane; lamelle frontale prolongée encore au-delà de la tête, bilobée et portant les antennes. Scape long, un peu arqué, subcylindrique, sans spinules à son extrémité, à peine plus long que le 3ᵉ article, 2ᵉ article de moitié plus long que gros, 3ᵉ presque triple du 2ᵉ, au moins de moitié plus long que le 4ᵉ, 5ᵉ un peu plus court que le 4ᵉ, un peu plus long que le 6ᵉ, 6–12 égaux, cylindriques, de moitié plus longs que gros, 13ᵉ plus long que le 12ᵉ. Pronotum profondément découpé en arrière; mesonotum un peu transversal, sillons parapsidaux larges, faiblement convergents en arrière, où ils sont distants de deux fois leur largeur. Scutellum allongé, fossettes antérieures allongées, séparées par une arête, un peu plus courtes que les fossettes latérales, fossettes du bord postérieur ponctiformes. Segment médian à 3 arêtes parallèles, angles postérieurs prolongés en dent. Ailes jaunâtres, costale nulle, sous-costale brune, atteignant presque le milieu de l'aile, marginale carrée, stigmatique oblique, pas plus longue que la marginale, un trait brunâtre indique une trace de récurrente oblique, bords non ciliés. Tibias graduellement et faiblement renflés. Pétiole deux fois aussi long que gros, subcylindrique, avec 3 fortes arêtes dorsales; abdomen ellipsoïdal, déprimé, grand tergite occupant un peu plus des deux tiers antérieurs, à sillon traversant le tiers antérieur, les quatre suivants graduellement raccourcis.

Taille: 3.5 mm.

Localité: LUZON, Laguna, Los Baños.

Genus HEMIGALESUS Kieffer

Les espèces qui forment ce genre sont particulières aux Philippines; elles se distinguent de la façon suivante:

1. Les deux spinules externes de la tête sont pointues et plus longues que larges .... 2.
   Les deux spinules externes sont en forme de lamelle un peu transversale et arrondie .... 5.
2. Mesonotum fortement convexe dans sa partie médiane, déprimé ou enfoncé latéralement .... 3.
   Mesonotum également convexe partout, sans dépressions latérales .... 4.
3. Noir; face, pleures en partie, hanches et pattes rousses, tête un peu transversale vue d'en haut .... **H. niger Kieff.**
   Roux; abdomen noir sauf le pétiole, tête un peu allongée vue d'en haut. **H. rufus Kieff.**
4. Yeux deux fois aussi larges que leur distance du bord occipital. **H. brevicornis Kieff.**
   Yeux à peine plus larges que leur distance du bord occipital. **H. gracilis Kieff.**
5. Bouche perpendiculaire au grand axe de la tête et atteignant la demi-hauteur de la tête, 2e article antennaire du mâle obconique, au moins aussi long que le 4e .... **H. longirostrum sp. nov.**
   Bouche ayant au maximum le quart ou le tiers de la hauteur de la tête, 2e article antennaire du mâle subglobuleux, n'atteignant que la demi-longueur du 4e .... 6.
6. Bouche continuant la direction du grand axe de la tête, scape avec une dent au milieu du côté externe, tête et thorax roux (♂). **H. dentatus sp. nov.**
   Bouche perpendiculaire au grand axe de la tête, scape inerme, tête et thorax noirs (♂), ou tête noire, thorax roux (♀).. **H. auriculatus sp. nov.**

Hemigalesus auriculatus sp. nov. (♂, ♀.)

Tête noire, thorax et abdomen d'un brun noir chez le mâle, roux marron chez la femelle, pétiole de la femelle et pattes d'un roux jaune, antennes d'un brun sombre chez le mâle, d'un roux jaune chez la femelle. Tête subglobuleuse, spinule médiane petite, les 2 latérales en forme de lamelle un peu transversale, subarrondie. Palpes jaunes, pluriarticulés. Scape droit, bispinuleux à l'extrémité, sans dent au milieu du côté externe, 2e article très court et subglobuleux chez le mâle, moins gros et de moitié plus petit que le 4e, le 3e plus long que le 4e, 4–13 cylindriques, presque de moitié plus longs que gros, 14e de moitié plus long que le 13e et aussi gros que lui, flagellum pubescent et mat, 3e article de la femelle obconique, 3–9 également minces, 4–9 d'abord globuleux, puis un peu transversaux, 10–12 subitement très grossis, 10e et 11e aussi longs que gros, cylindriques, 12e ovoïdal. Bouche en forme de bec, presque perpendiculaire au grand axe de la tête, égalant le tiers ou le quart de la hauteur de la tête. Ocelles situés en avant, à la limite de la surface horizontale du vertex et du front qui est presque vertical. Tête vue de coté aussi longue que haute. Thorax d'un tiers plus long que haut. Partie postérieure des tempes et partie antérieure du prothorax avec un feutrage blanc. Mesonotum transversal, convexe au milieu, déprimé latéralement, de moitié plus long que le scutellum. Celui-ci triangulaire, aussi large que long, avec une fossette en avant. Segment médian avec une arête. Ailes subhyalines, dépassant beaucoup l'abdomen, ciliées longuement, sous-costale très rapprochée du bord, dépassant un peu le tiers proximal de l'aile, marginale obcunéiforme, basale d'un jaune pâle, double de sa distance de la marginale, perpendiculaire mais n'atteignant pas la sous-costale. Tibia postérieur subitement renflé au tiers distal. Pétiole non strié, aussi long que gros; abdomen déprimé, chez le mâle graduellement élargi jusqu'à l'extrémité du 2^e tergite, qui occupe les $\frac{4}{5}$ antérieurs de l'abdomen; chez la femelle l'abdomen est elliptique et le grand tergite atteint presque l'extrémité.

Taille: 2.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Hemigalesus dentatus sp. nov. (♂.)

Tête, thorax et pétiole d'un roux marron, abdomen brun noir, deux premiers articles antennaires d'un roux brun, pattes d'un jaune roux. Tête vue de côté un peu plus longue que haute, plus longue ventralement que dorsalement, bec continuant la direction du grand axe de la tête. Scape avec une petite dent au milieu du côté externe. Thorax de moitié plus long que haut. Pour tout le reste, semblable au précédent.

Taille: 2.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Hemigalesus longirostrum sp. nov. (♂.)

Noir; antennes d'un roux brun comme la bouche, hanches et pattes d'un roux clair. Bec perpendiculaire au grand axe de la tête, long, atteignant la demi-hauteur de la tête. Scape graduellement grossi depuis sa base, sans dent au côté externe, son extrémité est deux fois aussi grosse que le 2^e article, bispinuleuse; 2^e article obconique, au moins aussi long que le 4^e, 3^e distinctement plus long que le 4^e, 4–13 cylindriques, à peine plus longs que gros, 14^e plus mince que le 13^e et pas plus long que lui. Tarse postérieur comprimé, ce qui est aussi le cas pour les deux espèces précédentes. Pétiole un peu transversal, lisse et brillant;

tergites 3–6 égaux et très courts, abdomen de la longueur du thorax.

Taille: 2.5 mm. Pour tout le reste, semblable à *H. auriculatus*.

Localité: LUZON, Laguna, Mont Maquiling.

Genus GALESUS Curtis

Les espèces de ce genre qui ont été observées aux Philippines se distinguent de la façon suivante:

1. Ailes entières, non incisées ni pliées.......... 2.
   Ailes incisées à l'extrémité ou en arrière de l'extrémité.......... 4.
2. Pattes postérieures rousses, sauf les hanches.......... 3.
   Pattes postérieures en grande partie noires.......... **G. manilæ** Ashm.
3. Pétiole densément pubescent de blanc, articles du flagellum du mâle deux fois aussi longs que gros.......... **G. luzonicus** Ashm.
   Pétiole glabre dorsalement, articles du flagellum du mâle à peine plus longs que gros.......... **G. philippinensis** Kieff.
4. Sillons parapsidaux se touchant en arrière.......... **G. clavaticornis** Kieff.
   Sillons parapsidaux distants en arrière.......... 5.
5. Sillons parapsidaux distants en arrière d'un peu plus de leur largeur, pétiole du mâle deux fois aussi long que gros.......... **G. crawfordi** Kieff.
   Sillons parapsidaux distants en arrière de deux fois leur largeur, pétiole de moitié plus long que gros.......... 6.
6. Surface dorsale de la tête plus courte que la hauteur de la tête, sillon atteignant presque le milieu de l'abdomen.......... **G. curticeps** Kieff.
   Surface dorsale de la tête plus longue que la hauteur, sillon du 2e tergite prolongé par une ligne atteignant le dernier tiers.......... **G. lineatus** sp. nov.

Galesus (Schizogalesus) lineatus sp. nov. (♀.)

Noir, brillant, pattes sauf les hanches d'un roux clair. Tête allongée, sa surface dorsale plus longue que sa hauteur, plus courte que sa surface ventrale, lisse et brillante. Dents latérales du devant de la tête assez grandes. Yeux marginés en haut par une arête. Face très convexe, séparée de l'œil par un profond sillon, de chaque côté. Scape deux fois aussi long que gros, ridé en long, bispinuleux à l'extrémité, 2e article à peine plus long que le 3e, tous deux cylindriques, un peu plus longs que gros, 4e et 5e aussi longs que gros, 2–5 également gros, 6e à peine plus gros que le 5e, mais un peu moins que le 7e, presque transversal, 7–11 transversaux, 12e ovoïdal, pas de massue distincte ou massue de 6 ou 7 articles; flagellum pubescent. Collier du prothorax et feutrage des tempes d'un gris sombre. Sillons parapsidaux profonds, divergents en avant, distants de deux fois leur largeur au bord postérieur. Fossettes du scutellum séparées par une arête, un peu allongées, mais moins longues que les fossettes latérales, les 2 fossettes postérieures ponctiformes. Ailes un peu brunies, pliées, échancrées en arrière de la pointe alaire. Tibia postérieur graduellement et faiblement grossi dans sa moitié distale, métatarse postérieur pas deux fois aussi long que le 2e article. Pétiole de moitié plus long que gros, cannelé grossièrement, 2e tergite occupant presque tout le dessus de l'abdomen, sillon traversant le tiers antérieur du grand tergite, prolongé ensuite par une fine ligne jusqu'à l'extrémité du 2e tiers; à sa base se voit de chaque côté une petite fossette; le 2e tergite couvre encore de chaque côté un quart de la largeur des sternites 2–5 et une partie du 6e, dorsalement il couvre les tergites 3–5.

Taille: 3.5 mm.

Localité: LUZON, Laguna, Los Baños.

Genus STYLOPRIA novum

Diffère de *Phænopria* surtout par les yeux poilus et le scape, dont la moitié proximale est filiforme et la moitié distale subitement grossie très fortement. Le type est:

Stylopria rufa sp. nov. (♀.)

Roux clair; antennes à massue d'un brun noir, abdomen noir, tiers postérieur brun roux sombre. Tête globuleuse, lisse et brillante comme tout le corps, large comme le thorax. Yeux glabres, circulaires. Bouche non proéminente. Palpes très courts, non proéminents. Bord postérieur des tempes avec une pubescence soyeuse. Scape à moitié distale subitement grossie, trois fois aussi grosse que la moitié basale qui est filiforme, 2e article obconique, deux fois aussi gros que le 3e, 3–9 également minces, obconiques, sauf le 9e qui est subglobuleux, 10–12 formant une massue subite et grosse, 10e subglobuleux, 11e transversal et plus gros que le 10e, 12e brièvement ovoïdal. Thorax un peu plus long que haut. Prothorax avec un collier de feutrage blanc, interrompu en haut. Mesonotum transversal, convexe, sans sillons parapsidaux. Scutellum convexe, sans fossette à sa base. Segment médian avec une faible carène. Ailes dépassant beaucoup l'abdomen, longuement ciliées, hyalines, souscostale formant le bord, dépassant un peu le tiers basal, marginale obcunéiforme, de son extrémité élargie part une trace de la basale dirigée obliquement vers la base alaire et fortement courbée en angle au milieu, une trace semblable ou ligne jaunâtre indique une médiane éloignée du bord, arquée, graduellement rapprochée du bord à son extrémité qui aboutit à la base de la marginale. Aile inférieure linéaire, sauf que son bord antérieur est relevé triangulairement à l'endroit des crochets frénaux, cils inférieurs deux fois aussi longs que la largeur de l'aile. Tibia postérieur subitement grossi au tiers distal. Pétiole aussi long que gros, pubescent de gris; abdomen à peine déprimé, fusiforme, aussi long que le reste du corps, 2ᵉ tergite occupant les deux tiers antérieurs, 5ᵉ tergite égalant le 3ᵉ et le 4ᵉ réunis, extrémité de l'abdomen en pointe.

Taille: 1,2 mm.

Localité: LUZON, Laguna, Los Baños.

Genus **ASHMEADOPRIA** Kieffer

Quatre espèces de ce genre reviennent aux Philippines; elles se distinguent comme il suit:

1. Yeux poilus .... A. (?) trichota sp. nov.
   Yeux glabres .... 2.
2. Scutellum caréné .... 3.
   Scutellum convexe, non caréné .... 4.
3. Pétiole pas plus long que gros, verticilles antennaires atteignant l'extrémité de l'article suivant (♂) .... A. bakeri Kieff.
   Pétiole de moitié plus long que gros (♀) .... A. subcarinata sp. nov.
   Pétiole deux fois aussi long que gros, verticilles antennaires atteignant la massue du 2ᵉ article suivant (♂) .... A. luzonica sp. nov.
4. Scutellum à fossette unique, tête et thorax noirs .... A. nigriventris Kieff.
   Scutellum à 2 fossettes ponctiformes et très distantes, tête et thorax noirs .... A. bipunctata Kieff.

Ashmeadopria luzonica sp. nov. (♂.)

Noir, brillant; antennes, hanches et pattes rousses, moitié basale du scape et massue des articles 4–13 un peu obscurcies. Yeux glabres. Antennes de moitié plus longues que le corps, 3ᵉ article cylindrique, aussi long que le 4ᵉ, à 2 verticilles de poils, 4–13 avec une massue deux fois aussi longue que grosse, pétiole au moins aussi long que la massue, mais graduellement raccourci et massue graduellement allongée, au 14ᵉ article le pétiole est très court, verticilles longs, atteignant la massue du 2ᵉ article suivant. Prothorax à collier de feutrage blanc. Mesonotum convexe partout. Scutellum caréné, avec une fossette unique. Segment médian avec une lamelle triangulaire. Ailes hyalines, longuement ciliées, dépassant de beaucoup l'abdomen, marginale comme d'ordinaire, n'atteignant pas l'extrémité du tiers basal, de son extrémité distale part une trace de la basale jaune brisée en angle au milieu. Pétiole deux fois aussi long que gros, lisse, brillant, sauf sur les côtés qui ont des poils soyeux blancs, longs, denses et dressés; abdomen en ellipse allongée, déprimé, grand tergite atteignant presque l'extrémité.

Taille: 2 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Ashmeadopria bipunctata Kieff.

Localité: LUZON, Laguna, Mont Maquiling.

Cet insecte n'était connu que de Los Baños; la femelle reste encore à découvrir.

Ashmeadopria subcarinata sp. nov. (♀.)

Noir; antennes rousses, sauf la massue, hanches et pattes jaunes. Tête globuleuse. Scape cylindrique, 2e article égal au 3e, obconique, 4–7 également minces, pas plus longs que gros, rétrécis basalement, 8–12 formant une massue graduelle, aussi longs que gros, sauf le 12e qui est ovoïdal et plus long, pubescence très fine et très courte. Tempes, devant du prothorax et métapleures avec un feutrage blanc. Scutellum à peine caréné, fossette unique. Ailes dépassant beaucoup l'abdomen, ciliées longuement, nervation ordinaire de ce genre. Tiers distal du tibia postérieur subitement grossi. Pétiole de moitié plus long que gros, sa moitié postérieure porte dorsalement un feutrage blanc, dense et long; abdomen un peu plus long que le thorax, déprimé, en ellipse, 2e tergite occupant plus des deux tiers antérieurs, extrémité un peu en pointe.

Taille: 1.8 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Ashmeadopria (?) **trichota** sp. nov. (♀.)

Se distingue de tous ses congénères par les yeux à poils longs et épars. Roux; antennes et pattes d'un roux plus pâle, deux derniers articles antennaires noirs, abdomen brun au milieu. Tête globuleuse. Tempes, devant du prothorax et métapleures, avec un feutrage blanc et dense. Scape subcylindrique, arqué, aussi long que les 3 articles suivants réunis, 2e article de moitié plus long que le 3e et plus gros que lui, tous deux obconiques, 4e obconique, un peu plus court que le 3e, un peu plus long que gros, 5–9 à peine plus longs que gros, 3–9 également minces, à poils égalant leur grosseur, 10e bien plus gros que le 9e mais bien moins gros que le 11e, ovoïdal, 11e et 12e très gros, finement pubescents, le 12e ovoïdal court, le 11e à peine transversal. Mesonotum convexe, transversal, sans sillons. Scutellum caréné, avec une fossette en avant. Ailes hyalines, dépassant l'abdomen, longuement ciliées, nervation ordinaire. Tibia postérieur subitement renflé au tiers distal. Pétiole subglabre dorsalement, de moitié plus long que gros; abdomen déprimé, aussi long que le thorax, en ellipse allongée, 2e tergite occupant les deux tiers antérieurs, tiers postérieur graduellement aminci.

Taille: 2 mm.

Localité: LUZON, Laguna, Los Baños.

Genus **TRICHOPRIA** Ashmead

Les espèces de ce genre qui ont été observées aux Philippines se distinguent comme il suit:

1.	Thorax roux	2.
	Thorax noir comme la tête et l'abdomen	3.
2.	Tête et quart postérieur de l'abdomen roux	T. analis Kieff.
.	Tête et abdomen noirs, sauf le pétiole	T. semirufa Kieff.
3.	Scutellum avec deux fossettes	T. maquilingensis sp. nov.
	Scutellum avec une fossette unique	T. caudata Kieff.

Trichopria maquilingensis sp. nov. (♂.)

Noir, brillant; 2 premiers articles antennaires roux, hanches et pattes jaunes. Tête globuleuse. Scape cylindrique, un peu plus court que les articles 2 et 3 réunis, 2e obconique, égal au 5e, 3e cylindrique, un peu plus long que le 4e, presque deux fois aussi long que le 5e, 4e arqué fortement, grossi à l'extrémité, plus long que le 5e, 5–13 un peu plus longs que gros, subcylindriques, à poils épars, égalant en longueur les $\frac{2}{3}$ de la grosseur des articles, 14e article un peu plus long que le 13e. Scutellum convexe, avec 2 fossettes distantes de leur largeur. Ailes hyalines, dépassant beaucoup l'abdomen, ciliées longuement, pubescentes sauf aux alentours de la sous-costale, marginale comme d'ordinaire, de son extrémité sort une ligne jaune et perpendiculaire. Tibia postérieur subitement grossi au tiers distale. Pétiole pubescent, de moitié plus long que gros; abdomen déprimé, elliptique.

Taille: 1.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

Genus **SCAPOPRIA** Kieffer

Scapopria atriceps Kieff.

Cet insecte, dont le mâle est encore à découvrir, n'était connu que pour Los Baños. M. Baker vient aussi de le découvrir au Mont Maquiling, très près à Los Baños.

BELYTIDÆ

Genus **XENOTOMA** Foerster

Une espèce était connue pour Los Baños; nous y ajoutons une seconde.

1.	Pattes blanchâtres, abdomen droit	X. philippinensis Kieff.
	Pattes d'un roux brun, abdomen recourbé au bout	X. soror sp. nov.

Xenotoma soror sp. nov. (♀.)

Noir; mandibules rousses et se croisant, antennes d'un brun noir, scape noir, pattes d'un roux brun. Antennes filiformes, scape plus long que le 3^e article, 2^e article globuleux, 3^e quatre fois aussi long que gros, 3–14 graduellement raccourcis, le 14^e un peu plus long que gros, plus court que le 15^e. Cellule radiale fermée, très mince, deux fois et demie aussi longue que large, beaucoup plus courte que la postmarginale, stigmatique oblique et très courte, récurrente plus longue que la marginale, continuant la direction du radius, puis dirigée par en bas, marginale un peu plus courte que la cellule radiale. Pétiole presque deux fois aussi long que gros, strié; abdomen aussi mince à la base que le pétiole, piriforme, grand tergite occupant les $\frac{4}{5}$, le dernier $\frac{1}{5}$ forme une pointe conique recourbée par en haut.

Taille: 2 mm.

Localité: LUZON, Laguna, Los Baños.

Genus **CINETUS** Jurine

Cinetus maquilingensis sp. nov. (♂.)

Noir; mandibules rousses, antennes d'un brun noir, pattes antérieures d'un jaune clair, sauf les trochanters et les hanches, les quatre pattes postérieures brunes sauf les hanches. Antennes filiformes, 2^e article subglobuleux, 3^e plus long que le 1er et le 2^e réunis, fortement découpé au tiers distal, renflé à l'extrémité, un peu plus long que le 4^e, les suivants graduellement raccourcis, les derniers encore trois fois aussi longs que gros. Ailes hyalines, marginale plus longue que la cellule radiale qui est étroite, fermée et à peine plus longue que la moitié de la postmarginale, stigmatique très courte, récurrente presque double de la cellule radiale, dirigée par en bas dès son origine, parallèle à la basale. Pétiole fortement strié, deux fois et demie à trois fois aussi long que gros, égalant au moins la moitié de l'abdomen qui est déprimé, brièvement fusiforme, strié à sa base, où il passe insensiblement au pétiole, sans séparation bien distincte.

Taille: 2.5 mm.

Localité: LUZON, Laguna, Mont Maquiling.

NOTES ON A NESTING PLACE OF CROCODILUS PALUSTRIS LESSON

By W. SCHULTZE

(From the Entomological Section, Biological Laboratory, Bureau of Science, Manila, P. I.)

One plate

During the biological expedition of the Bureau of Science and the University of the Philippines to Taytay, Palawan, April 7 to June 7, 1913, opportunity was taken to explore two lakes near Taytay, the larger one being called by the natives from the village of Bantolan "Manguao," the smaller one "Nagsirocan." According to the statements of old natives, neither had been visited before by white men. Lake Manguao is located approximately 8 kilometers south of the town of Taytay. Mr. E. D. Merrill and several natives relocated an old direct trail from Taytay to Lake Manguao during the latter part of April, 1913. A second trip to the lake was made on May 11, by a party consisting of A. L. Day, R. A. Rowley, Mrs. Schultze, myself, and several assistants and guides, and we camped there until May 16. Our camp was located on the southwestern shore. On May 14, while going close to the shore on a raft, Mr. Day[1] discovered a peculiar heap or mound of grass on the beach in one of the little bays of the lake. Upon coming back to camp, our guides, natives of the town of Bantolan, were asked as to the nature of the peculiar mound. They stated that it might be the nest of a crocodile. Whereupon the next morning Mr. Rowley, his assistant, Mrs. Schultze, and I went on a bamboo raft to investigate the place. The mound was made of a very coarse, wiry, thick-stemed grass (*Ischaemum* sp.) which had been torn out by the roots, scratched together, and piled up. A space about 8 meters long and 5 meters wide, on the sandy beach, had been cleared absolutely of the grass. The mound was located about 2 meters from the water. It was somewhat irregular in shape, about 2.5 meters in diameter at the base and 1.5 meters in height. All around the mound, foot marks of a crocodile and furrows made by the animal's claws could be seen, so it was evident that the reptile had completed the nest very recently, that is, within the preceding few days, as several heavy rains would have washed away the marks in the sand. In pulling the mound apart, it was noticed that the material was very firmly packed. The grass was mixed with sand and was moist. In about the center of the mound and about 40 centimeters above the ground, 30 eggs were found arranged in several layers. The eggs were taken with part of the nest material to our camp. One egg was opened, and it appeared to be absolutely fresh. On the next day, the eggs were transported in a tin can by carriers over a bad mountain trail to our main camp at Taytay. I there packed the eggs in a box filled with fresh grass, leaves, and some of the original nest-material. On June 7 the eggs were taken to Manila, where I kept them with the object of determining the period of incubation and time of hatching. Measurements of 20 eggs gave the following results.

---

[1] He states:

Lake Manguao is indicated on various charts, but because of the fact that very little surveying has been done in northern Palawan the lake has heretofore been incorrectly located. On May 14, I went on a bamboo raft southeast from our camp. On the southeast side of the second point I observed a mound of grass, the nature of which was not clear.

Measurements, in millimeters, of 20 eggs of Crocodilus palustris Lesson.

78 ×50	77 ×49.5	77 ×49.5	83.5×46
75.5×49.5	76 ×49.5	76 ×49	78 ×50
76 ×49.5	76 ×49.5	73.5×49	79 ×49
76 ×49.5	76 ×49	80 ×49	79 ×48
75.5×49.5	75.5×49.5	83.5×50	82 ×48.5

Average 77.65×49.15.

The egg is decidedly oblong ellipsoidal and has a very hard porous shell with a high porcelain luster. Though the color is a translucent white, the egg has very strongly marked opaque white band around the middle (girth). The band is about 4 centimeters wide and in strong contrast with the two ends of the egg.

The eggs were kept in the box with the original material and covered with a 5-centimeter layer of old horse manure. As the incubation proceeded, the white band on the egg became less distinct. On July 1, one egg was opened; the embryo was about 6.5 centimeters long. On August 19, another egg was opened, and the embryo was found to be 19 centimeters long. On September 4, as no egg had hatched, I opened all of those which showed signs of incubation and found that all of the embryos had died except in one egg which was about ready to hatch. Their death was probably due to the fact that the material in which they were packed had shrunken to such an extent that most of the eggs were not covered by more than 2 centimeters of the packing and that they therefore became too dry. At any rate, the time of incubation of the eggs of *Crocodilus palustris* is from seventeen to eighteen weeks in the Philippines.

During our stay at Taytay, we frequently noticed crocodiles close to the shore in the sea. The species was probably *Crocodilus porosus* Schneid., the widely distributed seashore species. On an expedition to Malampaya Sound, west of Palawan, on August 20, 1913, I saw a specimen of this species at very close range, and the natives informed me that these reptiles are very abundant at the farther end of the sound. This statement was verified by members of our party, who saw as many as twenty at one time. Their abundance there is probably due to the large number of fish found in the sound. A specimen of *C. porosus* Schneid., from Zamboanga, Mindanao, which I have had under observation for three years, measured 30 centimeters when received, and at the present time measures 85 centimeters, which indicates that crocodiles grow faster than is ordinarily supposed, at least during the early years of their life.

ILLUSTRATION

PLATE I

FIG. 1. A nest of *Crocodilus palustris* Lesson. (Photograph by R. A. Rowley.)

2. An egg of *Crocodilus palustris* Lesson. Actual size. (Photograph by Charles Martin.)

Vol. IX, Sec. D, No. 1 of this Journal was issued May 28, 1914; No. 2 was issued August 24, 1914.

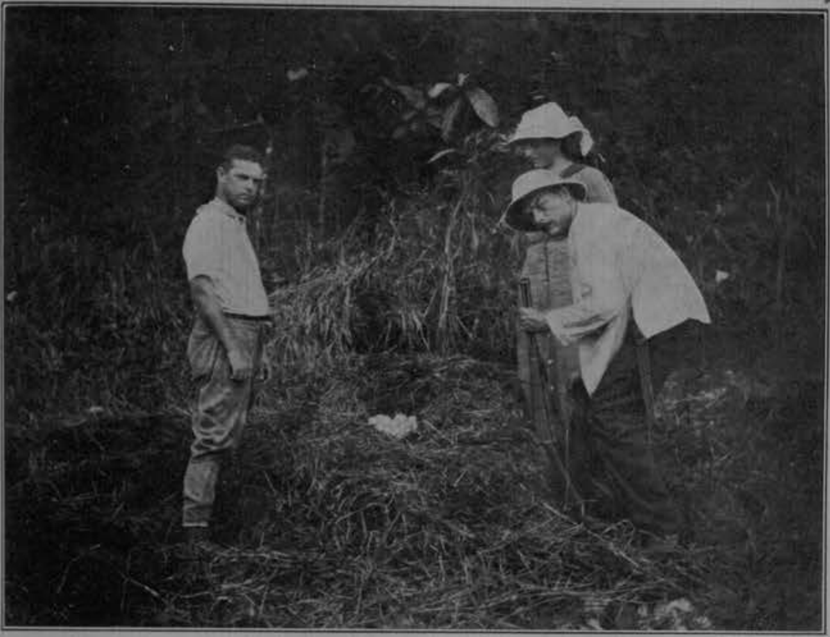

Fig. 1. A nest of Crocodilus palustris Lesson.

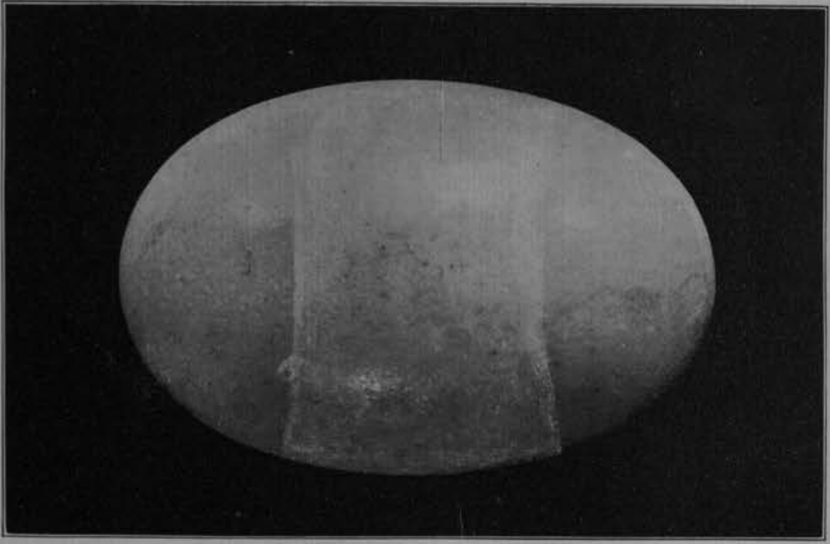

Fig. 2. An egg of Crocodilus palustris Lesson. Actual size.

PLATE I.

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ZOOLOGY—Continued

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Held at Mukden, April, 1911, under the auspices of the Chinese Government.

Edited by Erich Martini, G. F. Petrie, Arthur Stanley, and Richard P. Strong

483 pages, 18 plates (2 colored, 4 halftones, 12 charts and maps)

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